Chemical Week

October 6, 1956

Price 35 cents

Richmond, Va., looks to its river: deeper channel could double area's chemical capacity . . . . . p. 33

Fertilizer fog over the forest—how much plant food for 480 million hungry acres? . . . . . p. 52

Know how we stand on technical womanpower? Here's the news on lady researchers in CPI . . . p. 65

Sales agents can do a lot for up-and-coming specialties makers; they demand a lot, too . . . p. 82

CMRA meets in Quebec, surveys Canadian chemicals' trade, research, expansion prospects . p. 96

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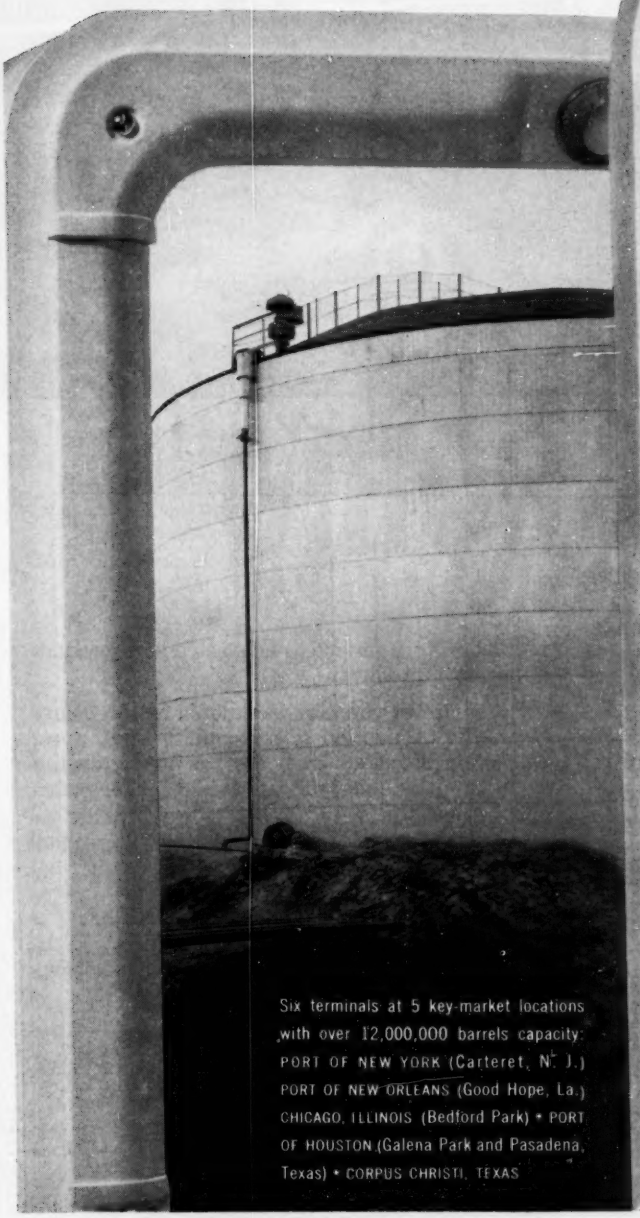

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Chemical Week

TOP OF THE WEEK October 6, 1956

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Expansion at the Indianapolis plant of the Inland Container Corporation required additional steam capacity. The expansion was complicated by the limited space available. Inland's Engineering Department, with the assistance of W. J. Barrows & Associates, Engineering Consultants, solved the expansion problem.

Today the power plant has a new 30,000 lb.-per-hr. boiler and also a 300-ton silo. Liberal use has been made of automatic controls; coal and ash handling have been completely mechanized. Now steam loads are adequately maintained. Boiler room performance has been highly satisfactory and economical. Furthermore, this modernization has enabled Inland Container to effect considerable savings by more efficient operation of its power system.

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Designing and building hundreds of heating and power installations a year, qualified engineering firms can bring you the latest knowledge of fuel costs and equipment. If you are planning the construction of new heating or power facilities—or the remodeling of an existing installation—one of these concerns will work closely with your own engineering department to effect substantial savings not only in efficiency but in fuel economy over the years.

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In most industrial areas, bituminous coal is the lowest-cost fuel available • Up-to-date coal burning equipment can give you 10% to 40% more steam per dollar • Automatic coal and ash handling systems can cut your labor cost to a minimum. Coal is the safest fuel to store and use • No smoke or dust problems when coal is burned with modern equipment • Between America's vast coal reserves and mechanized coal production methods, you can count on coal being plentiful and its price remaining stable.

Chemical Week

October 6, 1956 *Vol. 79, No. 14*

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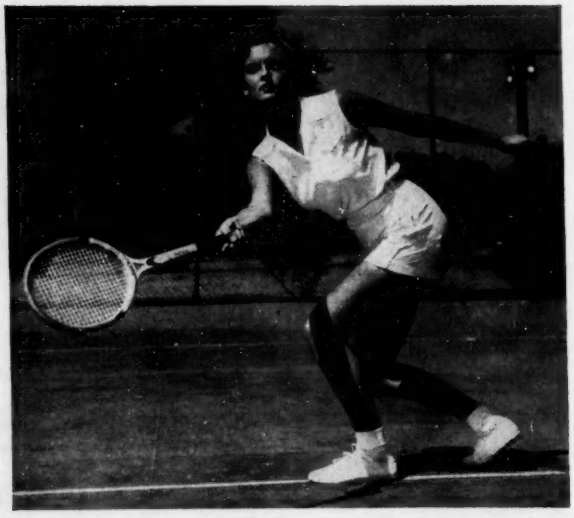
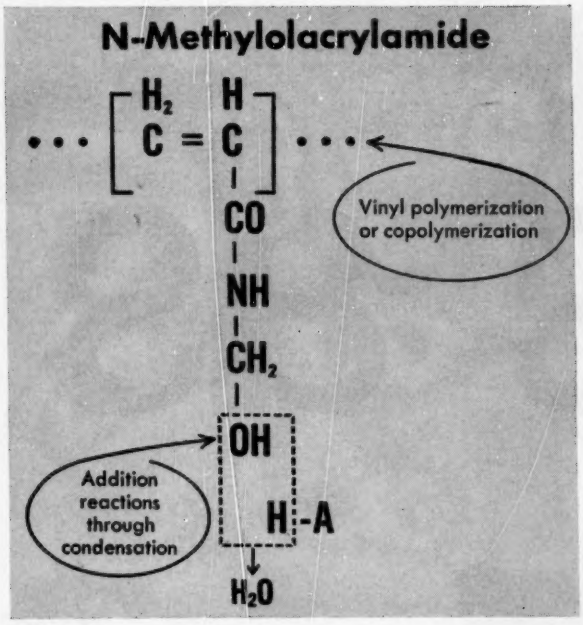
Life
on the Chemical Newsfront

NEW HIGH-STYLED COLORPHONES show the unlimited color range and unsurpassed hardness that account for the expanding use of CYMEL* melamine molding compounds in consumer and industrial products. Color is built in for lifelong beauty, in any shade, any tone you can imagine, from sparkling white through the spectrum to deep black. Since color is molded in, there are no extra finishing steps and no coating to drip, stain or wear off. Not only telephones, but fine dinnerware, appliance housings and other molded products benefit from the excellent resistance of CYMEL to heat, abrasion, staining and household chemicals. Many types of CYMEL molding compounds are available to meet various molding and application requirements. **(Plastics and Resins Division)**

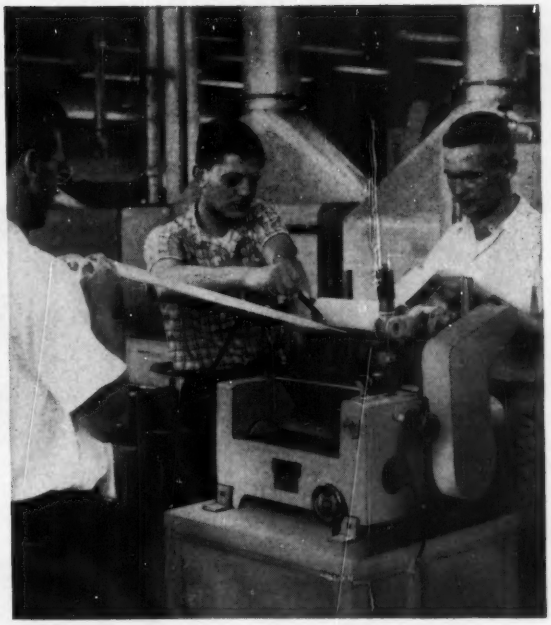
IT LOOKS LIKE A TOUGH SERIES for uniforms as for players. Hard wear, soiling, perspiration and frequent laundering take a lot out of the crisp flannels that start the season—but this year things look better. Eight major league clubs specified Cyanamid's LANASET® Finish for their uniforms because they found that the built-in shrinkage control and abrasion resistance keep them looking and fitting better. In all types of woolens, LANASET Resin penetrates the wool fibers, preserves their original finish and set, and makes shrinkage negligible. **(Organic Chemicals Division)**



FOOTWEAR THAT LASTS LONGER and does not discolor is one result of the use of Antioxidant 2246®. This product is well known for its ability to protect natural rubber compounds against surface deterioration, loss of flexibility and discoloration. Now its use as a stabilizer in "non-staining" synthetic rubber polymers adds a new phase to its versatility. Improved storage stability, little or no gel build-up, freedom from discoloration and protection against oxidation of the cured product are all built into these new polymers stabilized with Antioxidant 2246. **(Organic Chemicals Division)**



NEW BI-FUNCTIONAL MONOMER is N-methylolacrylamide, offering both addition and condensation polymerization possibilities through the active vinyl and methylol groups. The water solubility of the polymerized monomer may be modified to a desired degree through the incorporation of suitable hydrophobic monomers. Such resins show promise for sizing, dye additives and similar applications. Chain polymers or copolymers may be subsequently cross-linked through condensation, suggesting applications in adhesives, cements and thermosetting plastics. N-methylolacrylamide is available in research quantities. **(New Product Development Department, Dept. D)**



CONTROLLED PARTICLE SIZE is the criterion for the series of new improved CALCOLOID* Vat Dyes developed by Cyanamid. Above, a speck test is one of many performed to insure the high quality of these Vat Dyes now being shipped to the textile industry. Application characteristics dependent on controlled particle size, such as reduction rates, penetration and dispersion, are now more predictable, leading to better dyeing and more consistent results with continuous and batch production. Based on many years' research into dye technology, new manufacturing methods assure optimum particle characteristics for each dye for best performance. **(Organic Chemicals Division)**

*Trademark

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Additional information may be obtained by writing on your letterhead to the Division of American Cyanamid Company indicated in the captions.

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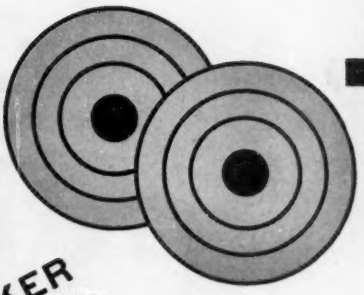

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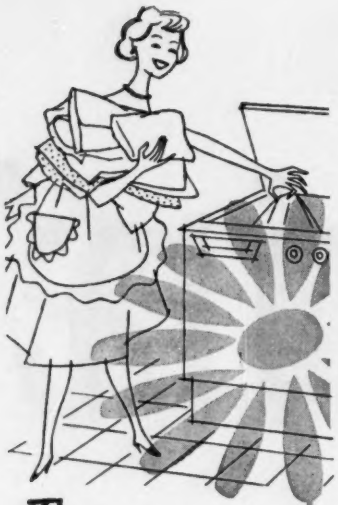

The odor of CLEANLINESS

When it comes to the family wash, today's housewife demands above all else, that elusive and intangible "clean odor." What is it? Largely a psychological concept . . . however, certain carefully balanced combinations of perfume ingredients can give to a washday detergent that special "sunshine clean" quality. **Furthermore, this desired fragrance will cling to the finished wash . . . if the perfume compound is properly formulated.** In the D&O Industrial Odorants Laboratories, a complete group of such "washday fragrances" has been developed, not only for **detergents** but for **blueing, starch** and **bleaches** as well. Let the D&O perfume chemists put the "odor of cleanliness" into your laundry products. Samples on request.

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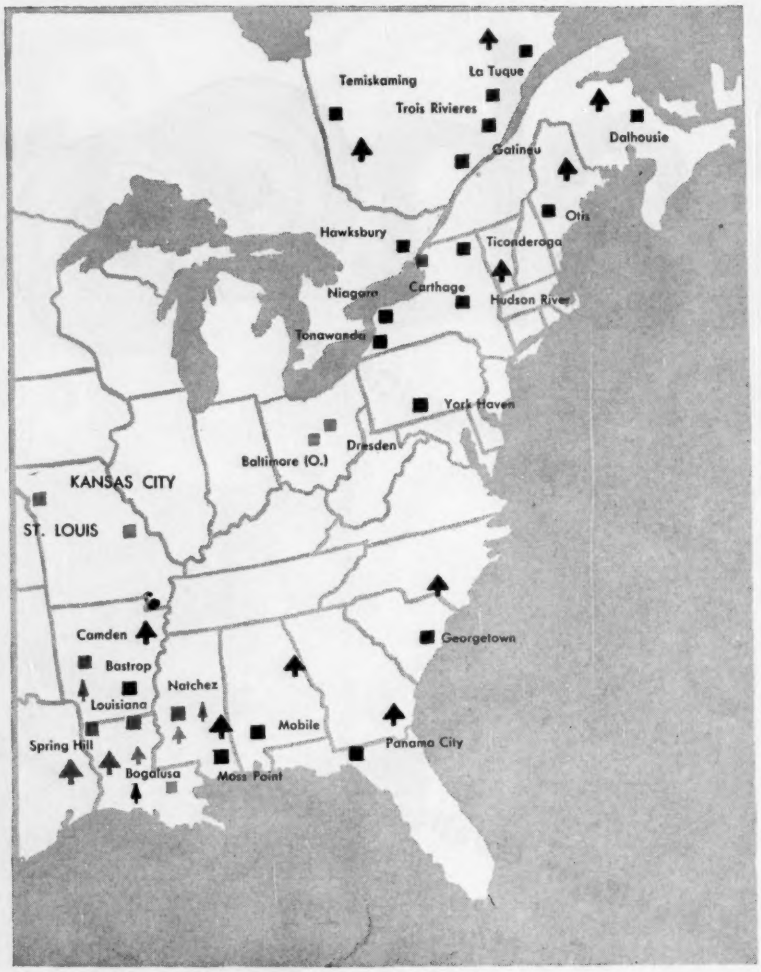
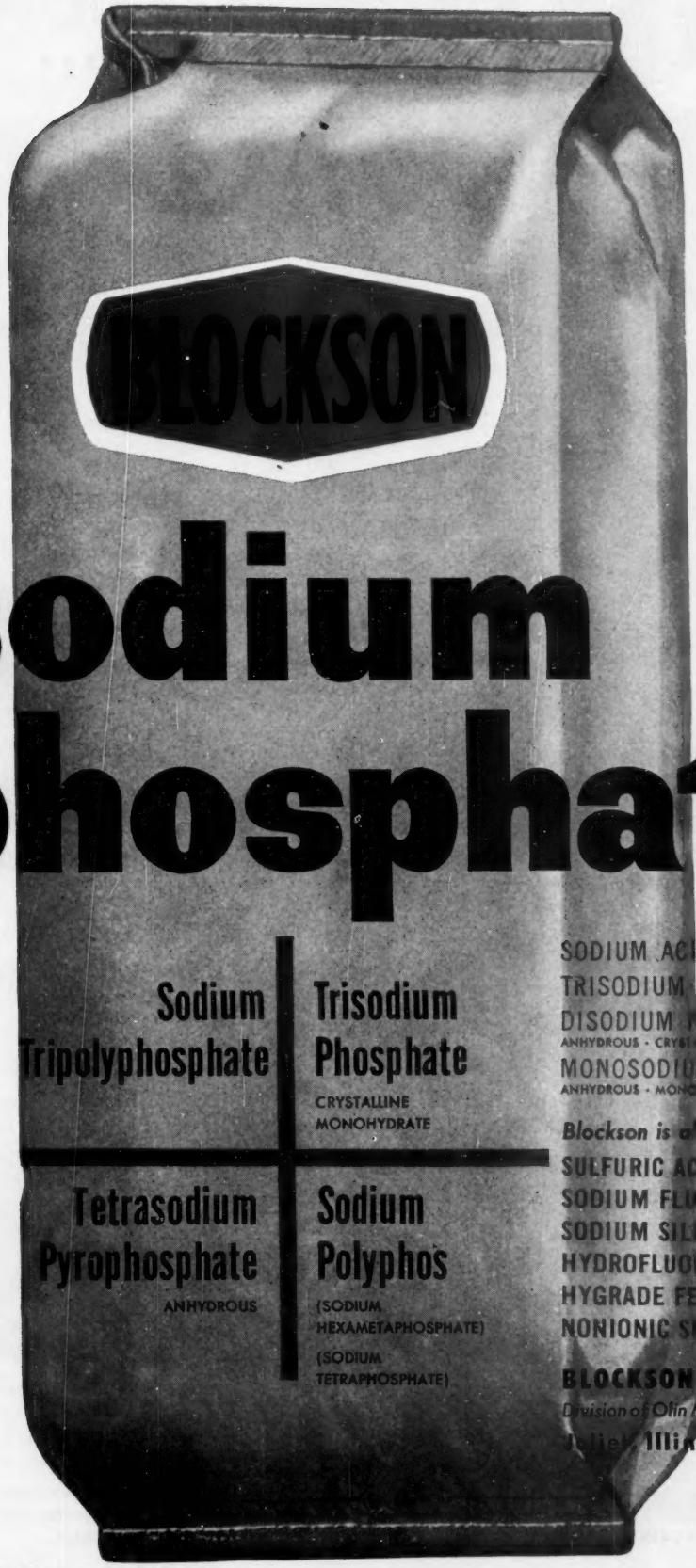


MAP SHOWS: International (merging with Long Bell) moving west; CZ (merged with Gaylord) going east.

KEY:	Forest Lands	Paper Mills
International Paper	▲	■
Long Bell Lumber	▲	■
Crown Zellerbach	▲	■
Gaylord Container	▲	■

No Paper Mills in the Gulf

No one who knows anything about the economics of the pulp and paper industry would put a paper mill in the middle of the treeless Gulf of Mexico —and printing presses know preciously little about papermaking. Our usually exacting presses went several degrees off course in lining up the Eastern color portion of the map in the Sept. 15 issue of *CW* ("Paper Producers Race for New Markets," p. 28)—which is by way of explaining how the paper mills got into the sea. St. Louis and Kansas City—as the letters published on p. 14 make clear—were other casualties of this cartographic



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Trisodium Phosphate
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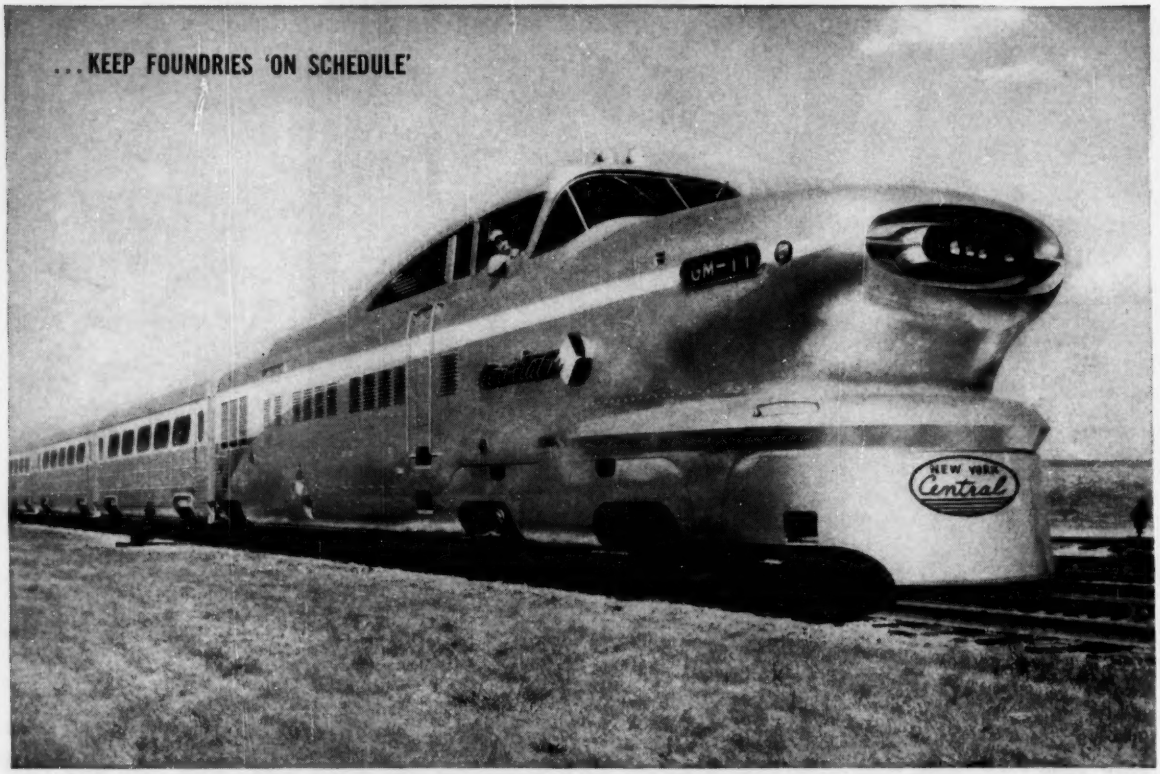
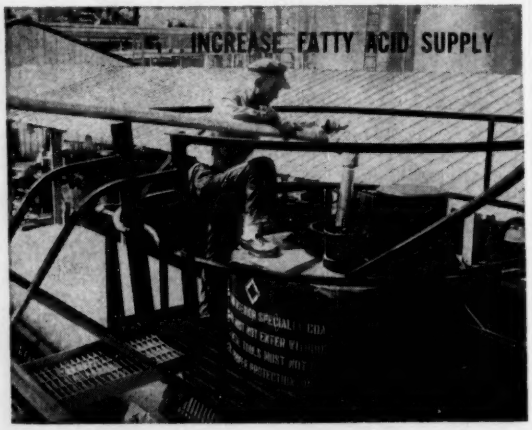


MODERN DESIGN—The New York Central's Aerotrain is typical of the new trains that were placed in service this year by the nation's railroads. Castings are vital to the production of such equipment and Hercules Truline® Binder helps foundries keep pace with the demand. Quick baking, Truline prevents oven bottlenecks, and Truline's easy collapsibility speeds finishing operations.



NOW IN OPERATION—At its new plant in Franklin, Va., Hercules is producing Pamak* tall oil fatty acids. These versatile chemical materials are finding ever-increasing use in printing inks, linoleum, paints, petroleum processing, disinfectants, detergents, flotation agents, and agricultural chemicals. A second plant for the production of Pamak is nearing completion at Savannah, Ga.

*HERCULES TRADEMARK

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Manufactured to the *highest commercial* specifications and produced under rigid quality controls, Catalin Antioxidants are available in uniformly sized white crystals or in solution.

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Should you therefore be exploring the subject and use of inhibitors, we commend the multiple advantages of Catalin Antioxidants to your consideration. Samples, literature and technical assistance wait upon your request. Inquiries invited.

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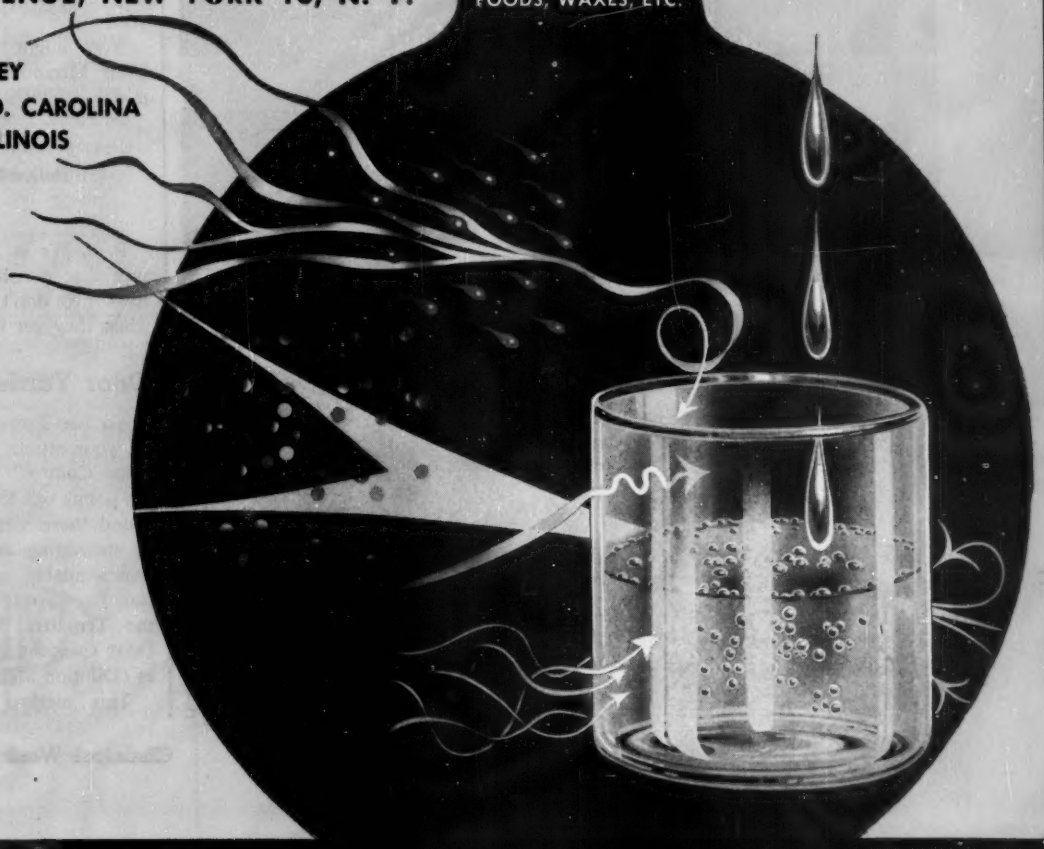

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dislocation. For the edification of our letter writers and all other *CW* readers, the correct map—with all mills on dry land—appears above (p. 10).

To THE EDITOR: The Sept. 15 issue of CHEMICAL WEEK carries on p. 28 a map of the United States locating the forest lands and paper mills of the two top pulp and paper manufacturers of the U.S. However, I was quite surprised to notice that in the middle of your map, Kansas City and St. Louis have been transposed. As a life-time resident of Kansas City, I hardly felt the move at all; and while our sister city of St. Louis is an equally fine place in which to live, it definitely is not on the border between Missouri and Kansas.

I am sure that several of your good readers in St. Louis will also bring this to your attention.

G. L. MACCURDY
Materials Engineer
Bendix Aviation Corp.
Kansas City, Mo.

To THE EDITOR: Your article "Paper Producers Race for New Markets" (*Sept. 15*) might have been interesting, but after I saw your map of the U.S., I was afraid to read any further. You really don't think that St. Louis is west of Kansas City, do you?

You might be correct, but I'm from Mizzou and "you gotta show me!"

J. E. WINDBIEL
Sales Representative
Allied Chemical & Dye Corp.
Barrett Division
St. Louis, Mo.

P. S. We in the Midwest are now sure that our theory is correct; i.e., Easterners don't know "which is who" when they get west of Ashtabula.

Odor Yardstick

To THE EDITOR: I read with interest your article "Up in the Air Over Odor Control" (*Jan. 28*). The article points out that Procter & Gamble found there were no rules to go by in measuring odor. Such rules are now available, and for your information I am enclosing a page proof of the Tentative Method of Test for Odor Concentration in Air and Gases (Dilution Method) (D 1391-56 T).

This method was developed by

"Many customers report our new 'shotted' urea fits their needs perfectly"

"This free-flowing form of Du Pont Urea has permitted quite a number of users in my area to simplify and speed up processing." This report from Du Pont Polychemicals representative Bob Harbour is typical of comments received during recent months.

An evaluation of Du Pont Shotted Urea in your operations may prove to be the answer to one of your processing problems. Or if you require urea in its crystalline form, remember that Du Pont Crystal Urea still sets the standard for purity for *all* industrial chemicals . . . no other chemical product sold in tonnage lots has higher purity.

Few other chemicals, too, have a wider range of applications than Du Pont Urea. Urea-formaldehyde resin adhesives . . . wet-strength coatings . . . textile sizes and finishes . . . and urea-formaldehyde molding compositions are a few of the principal uses for this versatile chemical. Strict adherence to rigid specifications assures the user of dependable purity and uniformity.

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BOB HARBOUR is sales representative for the Du Pont Polychemicals Dept. in northeastern Ohio, western Pennsylvania and western New York. Bob, a graduate chemical engineer from Ohio State, has had extensive experience in serving the chemical process industries. Like his fellow salesmen, Bob is equipped to work closely with customers in determining individual chemical requirements.

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OPINION

ASTM Committee D-22 on Methods of Atmospheric Sampling and Analysis. Procter & Gamble participated in the development of this method, which will provide a yardstick for all industry to use in the measurement of odor.

This method will appear in the 1956 Supplement to Part 7 of the ASTM Book of Standards, and will also be available in pamphlet form by the end of this year.

Other methods developed by ASTM Committee D-22 are indicated in the attached news release, dated April 12, 1956.

FRANK Y. SPEIGHT
Assistant Technical Secretary
American Society for Testing Materials
Philadelphia.

Big Name in Polymers

TO THE EDITOR: May I take this opportunity to tell you how very much I liked the article titled "Big Names in Polymers Meet" (*Aug. 4*), and how very much impressed I was by the very excellent way in which CHEMICAL WEEK covered the Notre Dame Conference.

With kindest regards and best wishes.

H. MARK
Director, Polymer Research Institute
Polytechnic Institute of Brooklyn
Brooklyn, N.Y.

Location—Not Operation

TO THE EDITOR: In your Aug. 11 issue, there appears to be a slight misconception in the article on "U.S. Pollution Research Goes on Ice."

In the headlines . . . as well as in . . . the text, credit is given to the "University of Cincinnati's Sanitary Engineering Center."

The fact of the matter is that the Robert A. Taft Sanitary Engineering Center is the center for sanitary engineering research of the U.S. Public Health Service and is manned by USPHS personnel. The University of Cincinnati, being a municipal institution, has no part in the administration of the Sanitary Engineering Center. . . .

LAN J. WONG
Wong Laboratories
Cincinnati, O.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: H. C. E. Johnson, Chemical Week, 330 W. 42nd St., New York 36, N.Y.

Dakota Sulfur

TO THE EDITOR: We were very much interested in the article "Mining Keys Twin Cities' Chemical Future," and its comments regarding the growing awareness in the chemical industry of the markets developing in the Northern Plains area.

An additional raw material that may be of interest to your readers is raw sulfur being produced from natural gas in western North Dakota. We will gladly furnish additional information to interested organizations.

DAVID S. CARSON
Area Development
Northern Natural Gas Co.
Omaha, Neb.

SEE YOU THERE

National Metal Congress and Exposition, Cleveland, Oct. 8-12.

Society of the Plastics Industry, Inc., conference, The Wentworth Hotel, Portsmouth, N.H., Oct. 11-12.

Salesmen's Assn. of the American Chemical Industry, 5th chemical sales clinic, Hotel Commodore, New York, Oct. 15.

National Assn. of Corrosion Engineers, Drake Hotel, Philadelphia, Oct. 15-17.

Assn. of Official Agricultural Chemists, 70th annual meeting, Shoreham Hotel, Washington, D.C., Oct. 15-17.

Canadian Agricultural Chemicals Assn., 4th annual meeting, Sheraton Brock Hotel, Niagara Falls, Ont., Oct. 16-18.

Antibiotics Annual Symposium, Willard Hotel, Washington, D.C., Oct. 17-19.

Federation of Paint and Varnish Production Clubs, 34th annual meeting, Netherland Hilton Hotel, Cincinnati, Oct. 21-24.

Assn. of Consulting Chemists and Chemical Engineers, Inc., annual banquet and symposium, Hotel Belmont Plaza, New York, Oct. 23.

National Assn. of Corrosion Engineers, Gunter Hotel, San Antonio, Tex., Oct. 23-26.

Dowell scientist using the Optical Emission Spectrograph to get an accurate analysis of samples sent in from the field.

On the trail of scale

Analyzing chemical cleaning drain samples to determine how much scale and metal were removed is easy for this laboratory detective. Among the instruments at his disposal is this Optical Emission Spectrograph, capable of tracking down impurities as low as .0001 per cent in certain elements. Instruments like this are in constant use by Dowell scientists in their day to day search for answers to your industrial cleaning problems.

They've got an eye to the future, too. For in this completely equipped and modern laboratory, new methods and treatments are being found to make Dowell chemical cleaning even more effective. Get the full benefit of the Dowell research program. Call your Dowell engineer. He's ready to help you.

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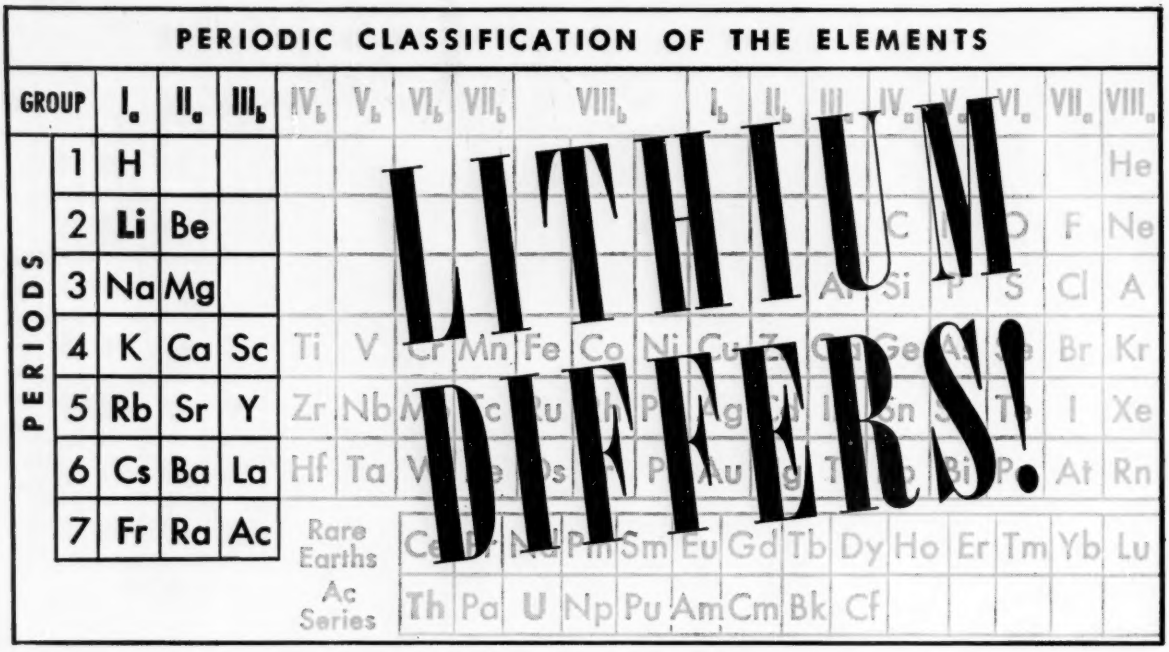

Lithium, by reason of its atomic configuration and general characteristics, is rightfully included as the first member of Group I in the Periodic Table. A detailed study of the properties and reactions of both the elements and their compounds, however, shows that Lithium often resembles the metals of Groups II and III more closely than Group I. Following are some characteristic differences:

Lithium differs in organic chemistry . . .
because its organolithium compounds form a unique class with stability, solubility and activity characteristics intermediate between those of the Group I and Group II organometallic compounds.

Lithium also differs from the other alkali metals in that it serves as a unique catalyst for the polymerization of diolefins to materials of definite and predictable structure. It directs, for example, the polymerization of isoprene predominantly to 1,4 addition structures.

Again, recent investigations have indicated an interesting potential as a direct reducing agent in solvents such as ammonia, low molecular weight amines, and ethylenediamine.

Lithium differs in metallurgy...
inasmuch as the affinity of Lithium for oxygen, for example, is being utilized to reduce porosity in copper and copper alloy castings. Recent research has revealed that Lithium will produce brazing alloys with self-fluxing properties and increase the wetting ability of these alloys.

Lithium differs in inorganic chemistry . . .
the usefulness of Lithium Hydride and Lithium Aluminum Hydride in the preparation of other hydrides having already been widely demonstrated. Recent studies indicate that other complex hydrides prepared in a similar manner may prove to be interesting tools for research. The low dissociation pressure of Lithium Hydride at its melting point, to cite a specific example, is unique among all hydrides. LiH also has some slight solubility in polar organic compounds which is again unique among alkali metals.

Lithium differs in heat transfer . . .
based on its physical properties it has no equal as a liquid metal coolant. Due to corrosion caused at elevated temperatures by impurities in commercially available Lithium and Lithium Metal, Lithium has thus far found only experimental use.

Why don't *you* take a long look at Lithium? Its uniquely valuable differences in so many diverse fields may prove of great interest—and profit—to *you*. Write our PR&D department giving us details of the application you have in mind. Experimental quantities of Lithium Compounds are available on request.

. . . trends ahead in industrial applications for lithium

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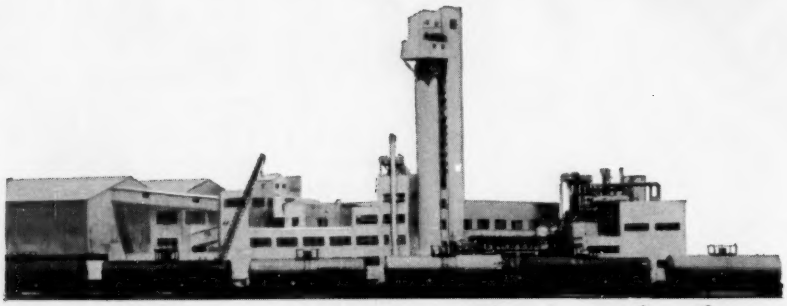

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Business Newsletter

CHEMICAL WEEK
October 6, 1956

Expansions and acquisitions highlight this week's news:

Diamond Alkali will boost, by 40%, its chlorine-caustic soda production at Deer Park, Tex. By the first half of '58, Diamond will be producing some 700 tons of chlorine, 770 tons of caustic and 7 million cu. ft. of hydrogen daily at the Texas plant.

Hercules Powder, via acquisition of Huron Milling Co. (Harbor Beach, Mich.), will diversify into the food chemical business. Among Huron's major products: amino acids and derivatives, gluten and starches. If, as expected, Huron stockholders approve the merger terms, they will receive one share of Hercules stock for each three they hold of Huron; and Huron will be operated as a part of Hercules' Virginia cellulose department.

Dow Chemical has exercised its option to buy two oil industry firms—Bay Refining Corp. and Bay Pipe Line Corp.—which are headquartered at Saginaw, Mich., near Midland. Dow will build an ethylene plant on a 1,000-acre site adjacent to Bay Refining's Bay City, Mich., refinery, to use refinery by-products. The ethylene will be shipped to Midland, where it will be used in plastics manufacture—replacing ethylene now shipped in from Freeport, Tex.

General Tire will further expand into the plastics business. It has acquired Lawrence Process Co. (North Andover, Mass.), vinyl and polyethylene compounder and processor. Still under negotiation: purchase of plastic pipe producer Carlon Products (Cleveland).

A shift in location is ahead for the Cincinnati workers of Toms River-Cincinnati Chemical Corp. The company will gradually transfer all operations at three Cincinnati locations to Toms River, N. J., where the firm now makes vat dyestuffs. It hopes to complete the transfer by 1959.

A shift in plans is also forthcoming on the National Farmers Union's projected fertilizer and agricultural chemicals plants (*CW, March 3, p. 82*). It will build the first of five plants in Omaha, Neb., rather than in Arkansas, as previously scheduled. The estimated cost of the five plants —each to serve a different state—is $15 million. An NFU subsidiary, Resources Corp., is arranging financing for the program.

Cyanamid is withdrawing from the sulfur business. The company has been buying sulfur from Stauffer Chemical and reselling it to customers for its other rubber chemicals. Now, Stauffer Chemical, trying to retain this market, is negotiating with the distributors Cyanamid has been using in selling sulfur.

Mark down a substantial expansion, by the way, for a company half-owned by Stauffer—San Francisco Chemical (*see p. 26*). Stauffer is

lending San Francisco $1 million for phosphate rock development, while its partner in the enterprise, Mountain Copper, is lending a similar amount —from the $2 million it received from Stauffer for the half interest in the firm.

Abandoned this week was Textron's plan to "spin off" its textile-making subsidiary from its chemical and other operations. But Chairman Royal Little, in a letter to stockholders, did not give specific reasons for the change in plans. There will, however, be a "drastic curtailment" of operations of Amerotron Corp., the textile-producing subsidiary.

Virginia-Carolina has a new president this week. He's William H. Wilson, 40, who's been executive vice-president of Standard Fruit and Steamship Co. (New Orleans). He joined V-C's executive staff this Monday, will be formally elected Oct. 29 at a directors' meeting. At the same meeting, the present acting president, Baltimore soft-drink bottler William Franklin, will step up to board chairman, replacing John S. Battle. Battle will remain on the company's board, as will Overton Dennis, Richmond, elected at last Friday's annual meeting to replace Rupert Zickl. Zickl, a leader of the insurgent group that gained control of V-C (*CW, July 28, p. 20*), died last Tuesday.

There's no word, incidentally, about the present management's plans for the company's former president, Joseph Howell. Howell still reports at the company offices each day; his employment contract (at $60,000/year) still has six and a half years to run.

•

Three West Coast air pollution notes—the San Francisco Bay air pollution control district (*CW, Sept. 29, p. 23*) officially went into operation this week. Lauren Hitchcock has resigned as president of the Los Angeles Air Pollution Federation. Two more U. S. Public Health Service engineers have been transferred to Los Angeles to aid in a joint county-federal project surveying oil refinery pollution and developing new instruments for measuring contaminants.

•

Thallium sulfate and parathion insecticide use has been limited as a result of poisonings blamed on the materials. Several Texas Cities—including Galveston, Texas City and LaMarque—have banned display or sale of insecticides containing thallium sulfate. In Arizona, state officials will review the qualifications of various crop dusting companies to be sure that they have proper equipment and knowledge to handle such highly toxic dusts as parathion. State officials will study whether to require farmers to register before they buy highly toxic pesticides.

Every Reader gets the same good impression

• Magazines with circulations running in the millions are faced with a serious problem. When the type or half-tone dots wear down to the shoulder of the etch, the result is a poor reproduction.

To save press down-time in replacing worn plates, and to be sure of the same fine impression on the last part of the run, plates must have surfaces that are resistant to abrasion. That's why printers use chromium-plated letterpress plates, electrotypes and gravure rolls. Then they are certain of getting clear impressions on every sheet from the first to the last.

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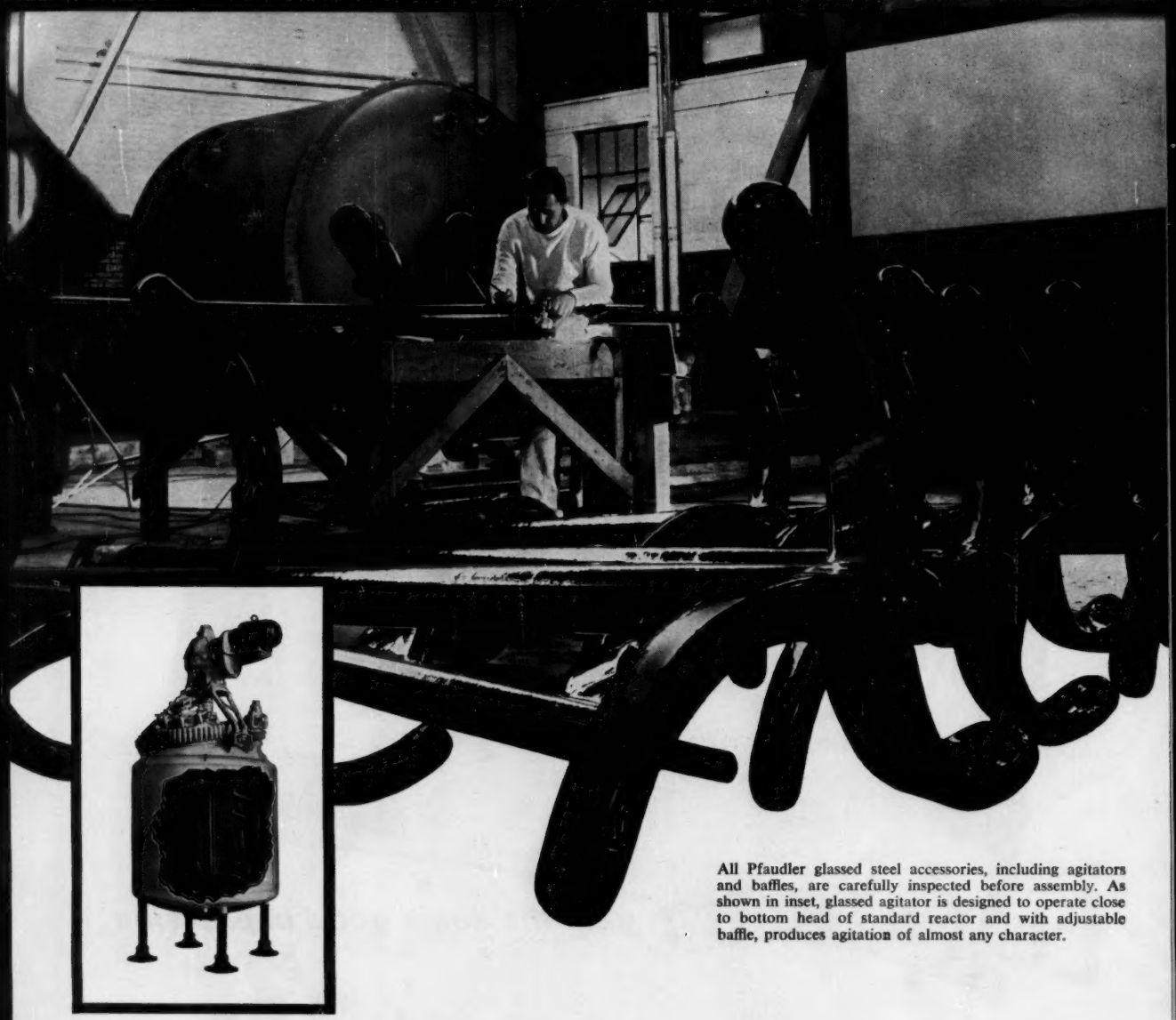

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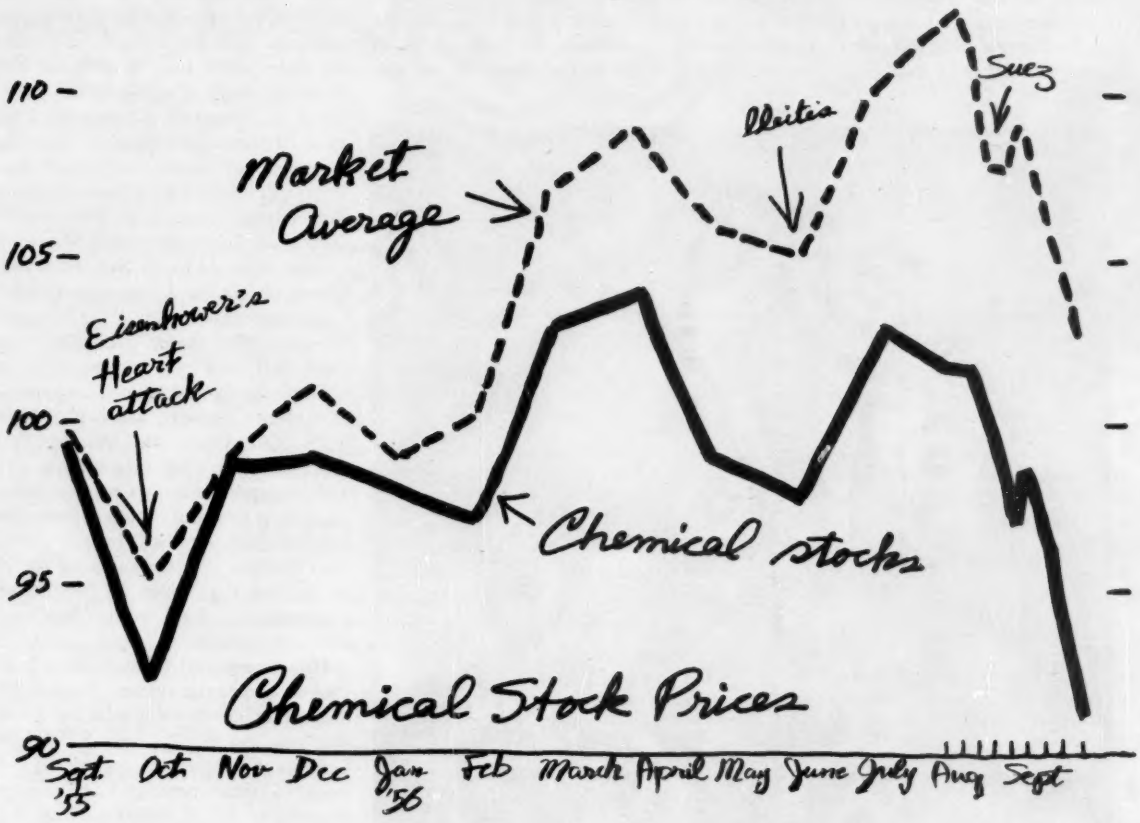


What Now for the Stock Market?

Charts like the one above have caused no little consternation the past few weeks to chemical firms pondering their financing plans and earnings outlook for the next five quarters.

In a stock market that's been declining steadily, and which hit new lows last week, the spread between chemical stock-price averages and those of the entire market seems to have widened at a remarkable rate.

Investors generally name four factors as being of importance in the softening of the over-all market recently:

- Tight money.
- Election jitters.
- International uncertainty — touched off by the Suez seizure.
- Skepticism over the outlook for sales of automobiles and similar consumer goods.

Whether these factors augur a slackoff of business in '57 is moot. Many concede that tight money is not a bullish influence. But they discount the possibility that these four factors should hit chemical companies any harder than industry generally.

For one thing, they say, indexes such as that above, though they do reflect an over-all situation, can often be misleadingly weighted. For example, if the price index for Du Pont stock, whose earnings include those derived from suffering textile business and auto industry investments, are omitted, the curve for chemical stock comes into much closer alignment with the composite market average.

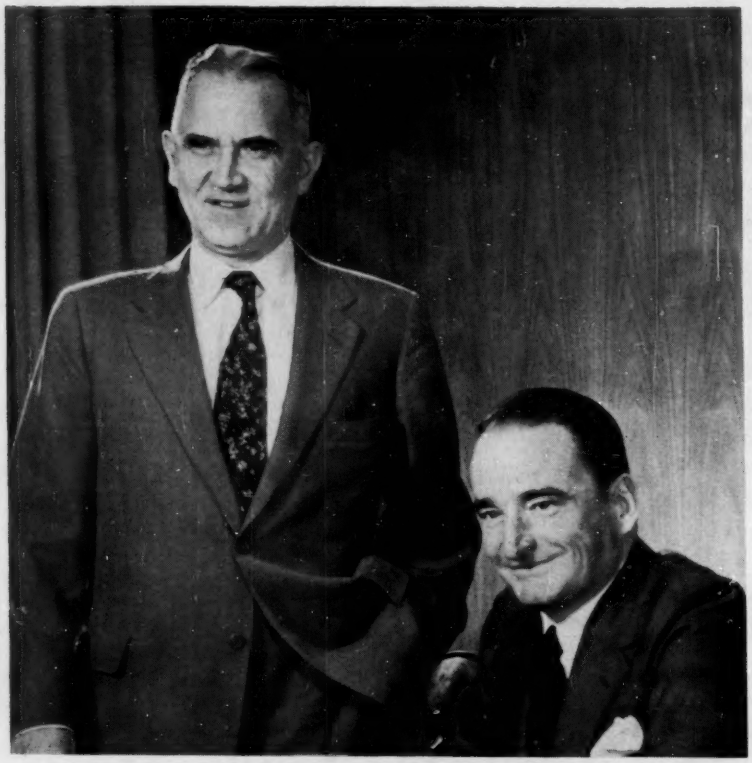
Fundamentally, a change in stock buying patterns is caused by something other than the immediate economic picture. Investors who have looked for growth (not only in sales and net income, but also in integration and diversification) in buying stocks have done well for themselves with chemical shares over the past seven years. In the last few months, however, preference of many investors has swung to stocks with high yields; and chemicals, historically slow in producing such yields, have not been much in demand, even at their new, lower prices.

A number of facts show why:

Lower chemical stock prices haven't always improved a stock's price-earnings ratio—which is one of the first things an investor looks at. Estimated 1956 earnings, which also help determine these ratios, have, in some cases, been pared noticeably recently.

However, chemicals have fared relatively better during the past two weeks than has the stock market as a whole. Significantly, though numerous new lows for 1956 have been registered recently, only a few chemical stocks, including Du Pont and Monsanto, have been among them.

But at their present price level, chemical stocks security analysts feel, are pretty well at a low point. Say the analysts: chemical stocks should do at least as well as the industrial average.



STAUFFER, DE GUIGNE: They're bringing associated firms . . .

Under a Single Roof

Its fourth merger within a year this week moved Stauffer Chemical further along toward corporate integration.

Merger of the two firms was approved by stockholders of Stauffer and of West End Chemical, meeting last Tuesday in San Francisco and Oakland, respectively.

Under the merger agreement, to take effect this week, West End stockholders are to be offered Stauffer shares that were worth some $22.5 million, at the market price prevailing just before the merger was approved.

West End's sales were $6.5 million in '55—primarily in soda ash ($4 million) and borax ($2.1 million). Sales of another product, salt cake, should run well over the $1-million mark this year, as the second of two new production units goes into operation.

Another Addition: This is Stauffer's second major addition within a year. Consolidated Chemical Industries formally merged with Stauffer last November. Previous to the mergers, Stauffer held substantial blocks of stock in the two firms.

But its acquisitions have gone beyond mergers with such publicly held stock companies. Stauffer also owns half interests in various other firms. Investment in such companies were one of the major ways in which Stauffer expanded its operations before its own stock was offered to the public in 1953.

Stauffer now owns two-thirds of stock in Wheeler, Reynolds and Stauffer, a California carbon bisulfide producer (the Reynolds family owns the remainder); too, Stauffer has half interests (with Canadian Industries, Ltd.) in Cornwall Chemicals, Ltd.; (with Montrose Chemical) in Montrose Chemical of California; (with Du-Pont) in Old Hickory Chemical; (with Philadelphia Quartz) in Philadelphia Quartz of California; (with Mountain Copper Co., Ltd.) in San Francisco Chemical; (with Kennecott Copper and American Smelting & Refining) in Western Phosphates. Stauffer also owns half of Flotal Licensing Corp.

Until August, it owned two-thirds of Nyotex Chemicals and half of New York-Ohio Chemical. But at that time, it completed negotiations by which it gave Harshaw Chemical some $2-million worth of Stauffer shares for the minority interests in the firms. And Stauffer officials make no secret of the fact that, given an "intelligent opportunity," they would buy out their other partners.

How Important? What do these half-owned companies mean, financially, to Stauffer? Their total sales for fiscal year's ending in 1955 were $25.5 million (Stauffer's own '55 net sales: $144 million); their profits, $2.6 million (Stauffer's, $12.3 million). One big disadvantage of the joint ownership: taxes. Stauffer had to pay corporation taxes on the $1.6 million in dividends that it received from the companies in '55.

But Stauffer's policy of picking up the other half of jointly owned companies doesn't preclude investment in other related ventures—e.g., recent purchase of half interest in San Francisco Chemical from Britain's Mountain Copper Co. (*CW Business Newsletter, June 9*). That deal was under consideration for over three years and was consummated at a time when San Francisco Chemical needed money to develop its phosphate-rock reserves. Stauffer is SF's major customer for phosphate rock—and SF is Stauffer's major supplier. Stauffer, understandably, wouldn't want to see even partial ownership of such a source fall into the hands of other Western fertilizer or chemical companies.

Pollution Powwow on James River

JAMES RIVER AT HOPEWELL: Industry reports pollution progress.

The city of Hopewell, Va., rich in chemical process plants, has a poser—how to control what might be considered the biggest water-pollution problem, real or potential, in the state.

The Hopewell area, one apex of the Richmond-Hopewell-Petersburg industrial triangle (*see pp. 33-36*), has many plants spotted along the James River. As a result, water pollution is a subject of real concern to area residents.

Despite previous moves to help combat pollution, voters in the area last year turned down a bond issue to finance new sewage disposal units. The disapproval, city officials say, may have been caused by uncertainty about industrial antipollution activities.

Last week, Hopewell citizens heard from industry. At a joint meeting with city officials and the Virginia State Water Control Board, plant men explained how and what they're doing:

• Continental Can, planning to expand its Hopewell pulp mill from 460 to 650 tons/day, told of installing new equipment that will keep total waste output from increasing, cut down present amounts of waste discharged into the river.

• Hercules Powder, which makes chemical cotton and other products at its Hopewell plant, plans to solve its pollution problem in a different way. Because of a drop in supply of cotton linters, it will "substantially" decrease production of chemical cotton—thus bringing its effluent well under allowable maximums.

• Allied's National Aniline plant was originally thought not to have a problem, but was found to be adding some pollutants to the river—believed to have been caused by faulty equipment. Corrective steps will be taken.

• Allied's Nitrogen Division plant reported "substantial progress" in eliminating surface oil films and sedimentable solids from its effluent.

These explanations, approved by the state board, satisfied the local officials —who hope that voters, in a referendum Nov. 6, will o.k. a $1.1-million sewer-bond issue.

VICTOR'S WEIGEL: His firm's plea for lower taxes is overruled.

Tax Setback in Montana

A 1951 Montana law that would provide tax incentives for new industry settling in the state was declared invalid last week by the Montana supreme court.

The ruling came in connection with Victor Chemical's appeal of an adverse district court ruling denying the company's plea to be taxed as outlined in the 1951 law. The five-year-old statute, designed to encourage new industry to locate in the state, provided a 7% tax on assessed valuation for the first three years of operation, with the regular 30% rate being used thereafter.

Victor contended that its Butte elemental phosphorus plant should be taxed only 7% of its assessed value of $1,892,400. Instead, the property was taxed in 1952 at the regular rate, 30%. Victor paid the taxes for the first half of the year—$14,666—under protest and filed action in Silver Bow district court to recover that amount.

The state's taxing agency denied the appeal, claiming that the 1951 law was discriminatory and apparently in violation of the state constitution.

The state supreme court decision last week upheld the ruling, which labeled the law unconstitutional because it "sets the plaintiff's industrial plant apart from other property of the same general kind and nature, and obviously discriminates against another of the same class."

New Home for Know-How

Unveiled last week was a location that will become familiar to many chemical management men. The pictures show the large auditorium (*above*) and one of the 31 conference rooms in the headquarters of the American Management Assn.; the brand-new facilities in New York's Astor Hotel were first used last week at the association's annual business meeting.

In the coming year, around a thousand process industry representatives should be meeting here to participate in the 450 different AMA courses and seminars on business management. Highlights: AMA courses on general facets of management, marketing, and cost reduction, aimed at helping industrial executives solve mutual problems through the use of group thinking.

Road Block Looms For GAF Sale

The question of whether a proposed reclassification of the stock of General Aniline & Film would change the equity of some stockholders in the corporation has caused a federal district court judge to bar the U.S. government from voting its 90%-plus holding of stock in favor of such a reclassification.

The meeting at which such a reclassification would undoubtedly have been approved was to be held this Thursday. But it was postponed because Federal Judge David Pine wasn't able to schedule hearings until Oct. 5 on whether the reclassification violates the law under which the U.S. government seized the stock of GAF in 1942.

It's unlikely, in any case, that the outcome of this hearing—termed by one observer as "another lawyers' detour"—will have any basic effect on the government's plan to sell its stock in GAF. But it will mean that more time will have to be spent in court before the sale can take place.

Road Map of Writs: GAF's directors, in an attempt to simplify the firm's corporate structure, wanted the company's stockholders to vote on a plan to issue a new type of common stock, replacing the two current series of stock. Such a move, say government attorneys, would be a perfectly natural one for any company to take in its ordinary course of business. But, of course, such is not the lot of General Aniline, since its stock was seized at the start of World War II by the government on the grounds that its former owner, the Swiss I.G. Chemie, was German "tainted."

The move to reclassify GAF's stock was objected to by two stockholder groups that own stock in Interhandel, the holding-company successor to I.G. Chemie, who claim GAF stock on the grounds that they were nonenemy stockholders in the Swiss firm. Interhandel itself also objected. Judge Pine granted a temporary restraining order barring the government from voting its shares until he could hear attorneys argue whether the reclassification does change the equity of the GAF stock claimants.

If Pine lifts the injunction, following the hearing, another meeting to

Washington Angles »

» **Those navy paint making plants** are about to be shut down. The Budget Bureau will soon issue a directive that would let the Defense Dept. close the paint plants at Norfolk, Va., and at Mare Island, Calif. The Pentagon has delayed shutdown, fearing that it wouldn't be able to justify it to the Senate Appropriations Committee. The latter's stand: the plants shouldn't be closed if increased costs resulted.

Budget Bureau reasoning: if the plants are closed before Congress reconvenes in January, the lawmakers might hesitate before ordering them back into operation.

» **Helium supply prospects** are worrying the Interior Dept. Though it has just awarded a contract to expand helium production capacity by 150 million cu. ft./year, it feels that this boost will suffice only until 1959 or 1960. After that, another plant will be needed.

» **U.S. investors are spending more abroad** than ever before, according to figures put out last week by the Commerce Dept. Outflow of U.S. capital in the first six months was $680 million greater than in the same period of '55. Of this, $280 million was in direct investment overseas.

This increase was the biggest factor in pushing U.S. commercial exports to a $17-billion yearly rate, the department reported.

» **Four more food colors** are likely to be formally taken off the list of approved coal-tar dyes that may be used in foods, drugs and cosmetics. The dyes: FDC Yellows 1, 2, 3 and 4.

FDA men admit that the materials are probably not deleterious in the amounts normally used, but it can't, under current law, set an upper limit on their use.

» **Phosphate lease acreage restrictions** will be discussed at the next session of Congress. That's been promised by Sen. James E. Murray (D., Mont.), who'll be either chairman or the ranking minority member of the Senate Interior Committee, when the 85th Congress convenes in January.

---

vote a reclassification will be held. (Of course, this might be delayed by a stockholder appeal.) If the government loses, it would face a decision on whether to appeal—on grounds that the reclassification is actually needed to improve the company's capital structure and that the interests of such intervening stockholders are not affected by it—or to just go ahead with the sale.

Start-up Slow-down

The start-up of Crown Zellerbach Corp's new paper mill at Antioch, Calif., will be set back as a result of picketing designed to prevent unloading of the first shipment of wet pulp from CZ's new Duncan Bay, B.C., kraft mill.

The Sailors Union of the Pacific is protesting use of a ship carrying a Liberian flag and a foreign crew to move cargo that traditionally has been assigned to American ships.

The ship being picketed, the S.S. *Duncan Bay*, is owned by National Bulk Carriers. Chartered by CZ, it was built in Japan especially for shipment of wet pulp from Duncan Bay to Antioch. In the past, CZ has shipped its pulp dry in bales. This is the first attempt to ship it wet via tanker.

As a slap to CZ, which it holds partly responsible for working conditions on the ship, the union placed pickets at a point where construction workers as well as dock workers would have to cross the picket line to enter the plant. Construction workers have refused to cross the line, so the final phases of construction work on the $18.5-million mill were halted.

Although the mill has not quite been completed, its equipment has been installed and it could go into operation shortly after the pulp is delivered. Production workers are ignoring the pickets, feel that this is a dispute between SUP and National Bulk Carriers.

The union said no negotiations with the *Duncan Bay* owners are scheduled. One SUP spokesman put it this way: "We're prepared to sit it out indefinitely."

Previous Parallel: The case is similar to a 1950 dispute involving SUP and Kaiser Gypsum. Kaiser chartered a ship of Panamanian registry, carrying a foreign crew, to haul gypsum from San Marcos, Mex., to the Los Angeles and San Francisco areas. After prolonged picketing, the owner sold the ship to Kaiser. Kaiser put an American crew on it—though the ship was kept under Panamanian registry.

SUP wants an American crew on the *Duncan Bay*—or American working conditions and SUP union cards for the present crew. Like the Kaiser ship, the *Duncan Bay* is not eligible for American registry because it was built outside the U.S.

CZ, of course, finds itself an interested, but innocent, bystander. Ironically enough, Zellerbach has an excellent labor relations record; it has not lost a day's time from a strike since 1934.

EXPANSION

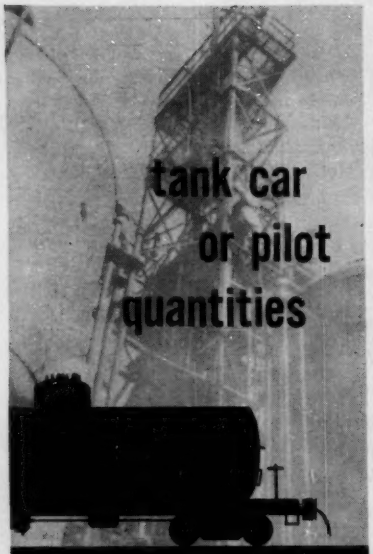
Detergent Alkylate: Imperial Oil, Ltd., has awarded Fluor Corp. of Canada a contract for construction of a new detergent alkylate unit adjacent to its Sarnia, Ont., refinery. The plant will go onstream next summer.

•

Uranium: Homestake-New Mexico Partners, partnership of Homestake Mining Co. and Rio de Oro Uranium Mines, Inc., proposes to build a 750-tons/day uranium mill near Ambrosia Lake, N. M.

•

Hydrofluoric Acid: Nichols Chemical Co. Ltd. will build a hydrofluoric acid plant at Valleyfield, Que., to produce both aqueous and high-purity



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anhydrous products. Construction will begin immediately.

•

Asbestos: Johns-Manville will expand its new asbestos fiber mill at Asbestos, Que. The project includes addition of some 75,000 sq. ft. of milling area.

•

Pulp and Paper: West Virginia Pulp and Paper Co. will double its pulp and paper output to 800 tons/day with a $50-million expansion and modernization of company facilities at Luke, Md. The new facilities are scheduled to start operating in April, '59.

• Midland Pulp & Paper Mills Ltd. will build a $3-million semichemical pulp mill at Brooklyn, Nova Scotia. The plant will have an initial capacity of 50 tons/day, will later be expanded to 200.

•

Butadiene: Odessa Butadiene Co. will install a 50,000-tons/year Houdry process butadiene dehydrogenation unit at Odessa, Tex.

COMPANIES

Cosden Peroleum Corp. has bought the refinery assets of Onyx Refining Co. for 40,000 shares of Cosden common stock. At current market prices this would be equivalent to about $885,000. Cosden took over operation of the 7,000 bbls./day refinery on Oct. 1.

•

Clorox Chemical Co. stockholders have approved an increase in authorized capital stock to 1,050,000 shares from 750,000. The company now has 723,444 shares outstanding.

•

Vanadium Corp.'s $10-million offering of 4½%, 20-year convertible subordinated debentures was more than 97.6% subscribed by company stockholders.

•

Metal Hydrides is offering subscription rights to stockholders for 85,266 additional shares of common stock at $17.50 a share, on the basis of one share for each three held as of Sept. 26. Proceeds will be used in part to finance new facilities to produce sodium borohydride.

•

Lone Star Cement Co. directors have proposed a 2½-for-1 stock split, an increase in authorized stock to 10 million shares from 4 million, and a revaluation in par to $4 per share from $10. Stockholders will vote on the proposal on Dec. 11.

•

Nicolet Industries (New York) has acquired a controlling interest, through issuance of additional stock, of Modigliani Glass Fibers, Inc.

•

Food Machinery & Chemical Corp. has formed an organic chemical division to handle sales and manufacture of the company's plastics line and all organic chemicals not directly linked to other chemical divisions.

FOREIGN

Nylon/Brazil: Credit Lyonaise of Paris will loan the Brazilian firm Rilson Brasileira S.A. $1.3 million for a new nylon-yarn plant to be set up near São Paulo.

•

Titanium Duties/England: Britain's Board of Trade has just announced that titanium dioxide will be exempt from import duties for an additional three months, ending Dec. 26, '56.

•

Quartz/Japan: Toyo Communications Machinery Co. (Kawasaki, Japan) has produced an artificial quartz crystal for the first time in Japan. Toyo hopes to start mass production of the man-made crystals by next spring.

•

Fertilizer/Korea: German corporations are reportedly interested in helping Korea build two $20-million fertilizer plants in South Korea. The Demag, Siemens and Lurgi companies, all in the Western zone, are expected to submit bids for the project.

•

Styrene/Britain: Petrochemicals Ltd., an associate of Shell Chemical Co., Ltd., will build a $4.9-million styrene-monomer plant at Partington. It's scheduled for completion by 1958. Chief customers will be Styrene Products Ltd., wholly owned subsidiary of Petrochemicals Ltd. and the synthetic rubber consortium, which is building a GR-S plant at Fawley.

•

Fertilizers/India: Two new nitrogenous fertilizer plants will be built in the Bhakra Nangal and Rourkela areas of India.

ANOTHER UNION CONTRIBUTION TO BETTER PACKAGING IN MULTIWALL BAGS

ADD A TOP CREASE to your sewn-valve Multiwall and you will substantially reduce sifting. Union packaging specialists will show you how this crease controls sifting by improving the closing of the insert.

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Detroit, Michigan
Houston, Texas
Los Angeles, California
Philadelphia, Pennsylvania
Pittsburgh, Pennsylvania
St. Louis, Missouri
San Francisco, California
South Kearny, New Jersey
Trenton, New Jersey

CANADA

Montreal, Quebec
Toronto, Ontario

MEXICO

Mexico, D.F.

UPPER SOUTH'S CHEMICAL CENTER: In Richmond and vicinity, inland seaports foster more industry expansion.

Richmond: Double Chemical Gateway

Deep water is the factor that helped build chemical manufacturing in Virginia's Richmond-Hopewell-Petersburg area to the point where it now employs about 10,000 people, and it may hold the key to even greater growth in the next few years.

But meanwhile, the chemical companies in this area aren't standing still as the U.S. Army's Corps of Engineers studies the feasibility of dredging the 25-ft. channel in the easy-going James River to 35 ft., deep enough for all but the very largest sea-going vessels. Among major expansion projects coming up:

- Just last week, Du Pont announced that construction will begin soon on a plant—to be added at the company's Spruance Works near Richmond—to produce 40 million lbs./year of heavy-denier, high-tenacity nylon yarn for tire cord and other industrial uses.
- Allied Chemical says its National Aniline Division plants at Hopewell and in Chesterfield County—making nylon intermediates and fiber—are expected to expand; and a building for textile fiber application research will be completed late this year at the latter site.
- Farther downstream along the James River, but still bearing witness to the attractiveness of this general area for chemical production, Dow Chemical has staked out a site for its $15-million plant to produce its new Zefran synthetic fiber (*CW, Aug. 18, p. 29*).

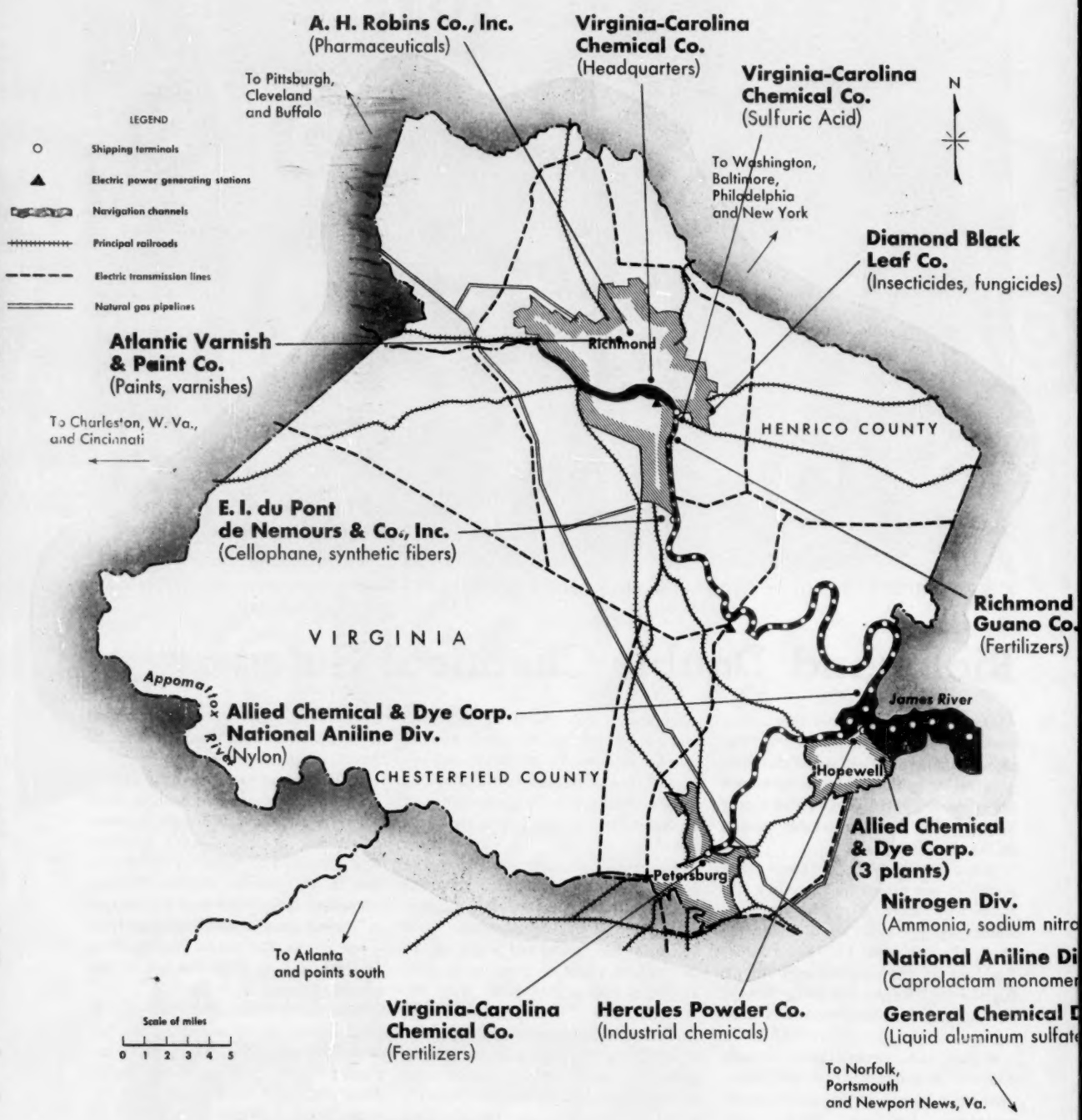
Two-Way Gateway: For some kinds of products, such as fibers for textile mills and fertilizers for cotton and tobacco farms, the Richmond vicinity* serves as a gateway to the growing markets of the upper South. And for products from regional resources like titanium ore and cotton, Richmond is a convenient base for distribution to Northern and Eastern states.

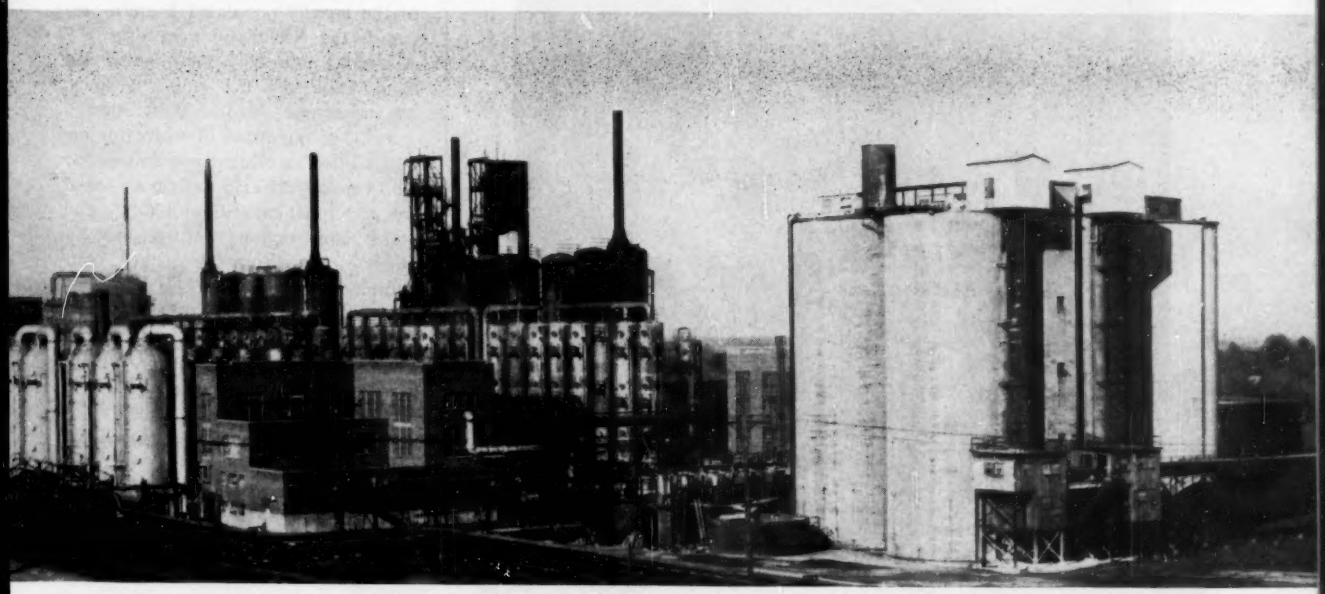
These considerations are as applicable today as they were back in 1882 when the late Capt. William Crenshaw established at Richmond a sulfuric-acid-from-pyrites plant—one of the first in the nation. Virginia-Carolina Chemical Corp.—formed by merger of various smaller fertilizer producers—set up its Richmond headquarters in 1895, and by 1910 was one of the largest concerns in its field.

Hopewell's chemical career began in 1912 when Du Pont built there an explosives plant that was greatly expanded during the next five years. Then the local boom went into reverse. From a World War I peak of 40,000 Hopewell's population skidded to a low of 1,369 before things picked up again. Two of the companies that gave Hopewell a new lease on life were Virginia Cellulose Co. and At-

*1950 population of Richmond, Hopewell and Petersburg and Henrico and Chesterfield counties, 373,000; estimated 1955 industrial employment, 43,000.

ON TIDEWATER CHANNEL, A GATEWAY TO THE SOUTH





REPUTEDLY WORLD'S LARGEST: At Hopewell, Allied's nitrogen products plant (ammonia, sodium nitrate, urea).

mospheric Nitrogen Corp. Later acquired by larger firms, those companies are now the Virginia Cellulose Dept. of Hercules Powder Co. and the Hopewell plant of Allied Chemical's Nitrogen Division, respectively.

Biggest Producing Units: Largest chemical facility in the area—Du Pont's Spruance Works, located just south of Richmond and near the much-traveled New England-to-Florida highway, U.S. No. 1—was started in 1928. Its three plants—making cellophane, rayon, and sulfuric acid—now have about 4,500 employees, and their combined payroll last year amounted to $22.7 million. These figures will likely be notably higher when the nylon plant comes onstream late next year.

Allied already has four plants operating in this area. First was the nitrogen plant, taken over by Allied in 1928. Subsequent expansion has made this the largest such plant in the world. Three years ago, Allied's National Aniline Division began building two plants: one adjacent to the Hopewell nitrogen plant to make caprolactam monomer and adipic acid; the other across the river in Chesterfield County, where the monomer is made into Caprolan, deep-dye nylon fiber. Newest Allied plant at Hopewell is General Chemical Division's liquid aluminum sulfate unit, completed earlier this year.

Hercules bought the Virginia Cellulose plant in Hopewell in 1926. By 1944, the principal products were ethyl cellulose, hydrochloric acid and ethyl chloride. Facilities for making sodium carboxymethyl cellulose (CMC) were added in 1946; and now the main products are purified chemical cotton, caustic soda, chlorine, ethyl cellulose and CMC.

Assets for Industry: Besides its strategic tidewater location near the middle

SULFUR BY SEA: From Gulf Coast direct to Richmond's deepwater wharf.

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ADMINISTRATION

of the heavily populated Eastern seaboard, the Richmond area offers:

- Four shipping terminals, six trunk railroads, five major airlines, and numerous motor freight lines.
- Large quantities of water for industrial use; an electric power network with capacity of 1.36 million kw. now and additional capacity of 300,000 kw. under construction; natural gas by pipeline; petroleum by tanker; and bituminous coal by rail.
- Moderate climate.
- A local government system that avoids overlapping taxation—plants are assessed by either a city or a county, not by both.

With these advantages and with a big industrial base to build on, the Richmond-Hopewell-Petersburg area —so its boosters maintain—stands to double its chemical process capacity if the 35-ft. channel project goes through.

Not to Be Discounted

(Smaller chemical process plants, not shown on map)

Company Name	Principal Products
Air Reduction Sales	Compressed gases
Alcatraz	Protective coatings
American Brands	Disinfectants, bleach
Bone Dry Fertilizer	Fertilizers
Colonial Chemical	Disinfectants, dyes
J. M. Fry	Printing inks
Charles C. Haskell	Pharmaceuticals
Haskell Chemical	Solvents, coatings, printing inks
Interchemical	Printing inks
Jerry Bros. Belting	Cleaners, polishes
G. K. Loving	Household disinfectants
Old Hickory Chemical	Carbon bisulfide
Physicians Products*	Pharmaceuticals
Polk Miller Products	Dog medicines
Wm. P. Poythress	Pharmaceuticals
Richmond Belt Dressing Mfg.	Preservatives, tanning materials
Richmond Refining	Grease and tallow
Sampson Paint & Color	Protective coatings
Shellmar-Betner (division of Continental Can)	Cellophane
Southern Adhesives	Adhesives, cleaning and polishing preparations
Southside Chemical*	Phenathiazine
Tobacco By-Products & Chemical	Insecticides, fungicides
Union Abattoir	Fertilizers
Valentine	Medicinal chemicals
Van Pelt & Brown	Pharmaceuticals
Virginia Fibre	Synthetic fibers

* At Petersburg; all others at Richmond.

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Quality is a popular song proudly sung, sometimes fortissimo, sometimes pianissimo . . . but sung so often the words almost lose their meaning.

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PLANT LOCATION FACTS

on financial assistance the free enterprise way

Financing a new plant today is a problem for any business, large or small.

In New York State, many banks, insurance companies and investment houses are willing individually to help you in making arrangements to finance new operations or build new plants. In addition, by special charter of the State Legislature, there has been established in the State of New York the New York Business Development Corporation. This organization is privately financed and managed and specifically designed to assist qualified enterprises in financing new or expanded operations in the State.

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Our booklet, "Industrial Location Services," explains what we can do for you. To get your free copy, write me at the New York State Department of Commerce, Room 590 112 State Street, Albany 7, New York.

Edward T. Dickinson

EDWARD T. DICKINSON
COMMISSIONER OF COMMERCE

NORTON'S DALY: An abrasives maker joins the trend toward . . .

Chemical 'Side Lines'

Signaling the growing importance of chemical "side lines" in major, largely nonchemical concerns are the reorganization moves—effective this week—setting up new chemical business units within three such big firms.

One is Norton Co. (Worchester, Mass.), whose increased electric-furnace business—plus a desire to leave an increasing amount of responsibility in the hands of division managers—has led to the establishment of the Electro-Chemical Division. The unit will handle production and sale of all products manufactured at the electric-furnace plants in Chippawa, Ont., Cap-de-la-Madeleine, Que., and Huntsville, Ala. (except sales of crude and finished abrasives).

Selected to head the new division as vice-president and general manager is Howard Daly, 58, a chemical engineering graduate of Tufts College. Daly started at Norton in the research division at Niagara Falls, N.Y.

GE Insulators: General Electric's Chemical and Metallurgical Division (Pittsfield, Mass.) has also jumped on the reorganization bandwagon by grouping manufacturing and sales functions of the company's principal lines of electrical insulating materials into a single organizational component located in the division's Chemical Materials Dept. This new component will form a special insulating materials section in Schenectady, N.Y.

Louis Newman—winner of GE's Charles A. Coffin Award in 1935 for developing special methods of calculating the performance of automatic extraction steam turbines—has been appointed manager of the new section. Newman's section will have responsibility for engineering, manufacturing and marketing varnished cloth and papers, mica products, insulating varnishes and compounds, special adhesives, Permafils and wire enamels now in production at the Schenectady location.

Standard Shuffle: Standard Oil of New Jersey has also answered the call for reorganization with the establishment of a chemical products section in its marketing coordination department. Section chief is C. J. Bitzer, long associated with manufacture and sale of Esso Standard's petrochemical products.

Formation of these new chemical units suggests that the postwar trend toward diversification into chemicals on the part of basically nonchemical companies is not letting up, may be intensifying.

LEGAL

Covenants Against Competition: A recent New York appellate court decision should lead chemical process companies to expect conservative rulings on complaints brought for violation of agreements that bind one party not to compete against a second firm in a certain field.

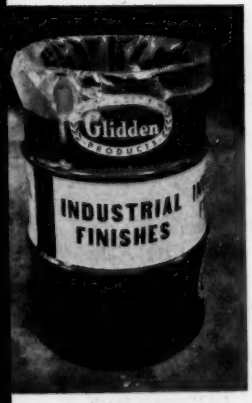
In affirming a lower-court decision in an action brought against Joseph, James and Patrick Garofano (Mt. Vernon, N.Y.) by GMC Process Corp. (New York), the appellate court ruled that the defendant had violated a covenant against competition, but added, "The injunctive provisions of the judgment (by the lower court), however, sweep out along broader lines than to prohibit merely the use of the process disclosed by the patent."

The patent in question was for a process for decorating plastic materials with silver. The three inventors—in assigning the process patent to GMC Process—agreed that for 15 years they would not directly or indirectly engage in any business "which will use the process in any manner or engage in the same or similar business to that of the (assignees) for ornamenting

"With previous forms of linings, we had to carefully screen every one for pin-holes, tears or streaks in the lining, before delivery. Men could often be tied up for hours in inspection. By using polyethylene film bags for liners, we eliminate this inspection operation." Liners are supplied by **M. J. Earle Suppliers,** Reading, Pa., and **Greene Manufacturing Company,** Philadelphia, Pa.

"the tough polyethylene drum liner

prevents acids from attacking the iron"



Drum liners made of BAKELITE Brand Polyethylene "have solved the hitherto serious problem of maintaining the viscosity of paint and latices during shipping and storage."

John P. Harner, Glidden Company, Reading, Pa., further reports: "The polyethylene film liner is durable, chemical resistant, water resistant, easy to work with, requires no attention or pre-shipping inspection, maintains the complete viscosity of our paints, has an excellent storage stability, is tough and flexible, protects paints from being contaminated by rusting of the containers, and, above all, assures us of a safe delivery.

"A paint's viscosity affects its uniformity of color, application characteristics, consistency and drying properties. Any deviation from the norm becomes a serious and expensive problem. However, we have found that material stored in this polyethylene lining for an indefinite period is as stable as the day it was put in."

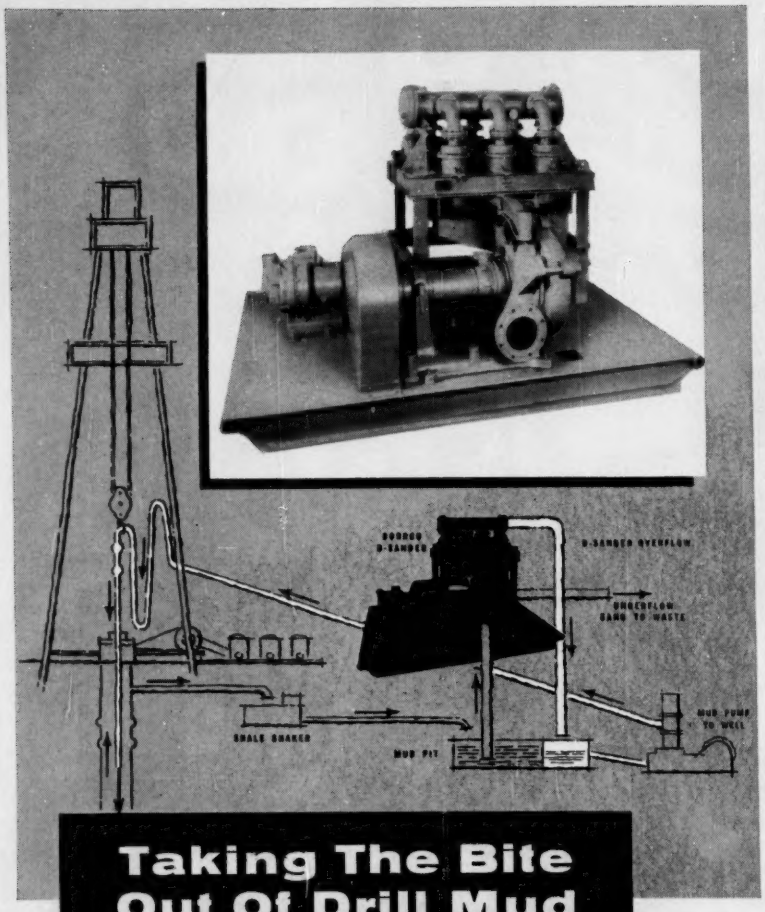
Film and other packaging made of BAKELITE Polyethylene may well offer you outstanding cost savings for shipping or storing chemicals. See your packaging supplier or write Dept. UO-34.

It pays to package in materials made with

BAKELITE
BRAND
Polyethylene Plastic

BAKELITE COMPANY, *A Division of Union Carbide and Carbon Corporation* UCC 30 East 42nd Street, New York 17, N. Y.

The term BAKELITE and the Trefoil Symbol are registered trade-marks of UCC.



Taking The Bite Out Of Drill Mud

Rotary drill muds are employed in oil drilling operations to remove cuttings and sand from the hole and to lubricate the drill bit in much the same manner that water cools a dentist's drill.

But don't let the word "mud" fool you. Drilling contractors will spend $20,000 or more per well on drill muds alone. Naturally rig operators want to recycle as much mud as possible. But the accumulation of sand and abrasives in rotary drill muds raises havoc with drill bits and pumps.

Late in 1954 the Dorrco D-Sander was developed to remove the harmful sand from drill muds by using a battery of DorrClone units. Typical savings for a 10,000 ft. well . . . a 79% reduction in repair parts costs . . . a minimum saving of 15 hours per well in rig time . . . 25% longer bit life . . . 19% more feet per bit. Or translated into dollars — an average saving of $3,500 per well.

Removing sand and abrasives from rotary drill muds may be only of academic interest to you. However if you have problems involving any phase of the separation of finely divided solids in suspension . . . or ion exchange . . . or fluidizing technique — chances are that Dorr-Oliver and its world-wide organization can help you.

D-Sander is a trademark of Dorr-Oliver Incorporated.

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ADMINISTRATION

articles made of plastic." The action was brought for a violation of this covenant.

In citing the lower court's error of making the injunction too broad, the appellate court said, the patentees ought not to be restrained from using all methods to decorate plastics with metal. "They should be restrained," the higher court added, "from using the method they have been employing, or a modification thereof that will reasonably be seen to infringe on the patent that the (patentees) have assigned."

This case is significant in the light of the tendency on the part of some assignees to attempt to make covenants against competition as broad as possible. In the past—when they have been reasonable in their demands on the patentee—such covenants have been supported by the courts. The indication is that this is still the practice.

•

Polio Suits: Two more suits, totaling $700,000, have been brought against Cutter Laboratories (Berkeley, Calif.) alleging the firm's polio serum resulted in paralysis of children. This brings to 28 the number of damage suits—totaling more than $6 million—filed against the company in California superior court since June '55.

A Cutter spokesman noted that U.S. Public Health Service has cleared the firm of negligence and has admitted that its own safety tests proved inadequate.

LABOR

Fertilizer Wage Boost: A union's attempt to close the gap between wage rates for chemical workers and fertilizer workers has met with only slight success. At Baltimore, a two-year contract with Davison Chemical Co., division of W. R. Grace & Co., has ended a 29-day strike by 975 members of Local No. 2, International Chemical Workers Union (AFL-CIO). The new pact calls for an immediate 11¢/hour increase for fertilizer workers, while chemical workers—also at the Curtis Bay Works—will get wage boosts of 7-12¢ plus reclassification increases of up to 5¢/hour. Both groups will get an additional 7¢ wage increase set for next August, and an escalator clause provides for cost-of-living increases. Throughout negotia-

Most versatile and efficient "short" gellant yet...

New "Dutch Boy" BENTONE® 38

- ***Thickens odorless and many hard-to-gel paints***
- ***Bodies wide variety of other organic systems***

With new "Dutch Boy" BENTONE 38, National Lead research has scored again!

On three counts BENTONE 38 is the most useful "short" gellant yet developed.

(1) Cuts quantity needed! Tests show, for instance, that only 50 to 70% of former requirements produces desired consistencies.

(2) Gels wide range of liquids! Take odorless mineral spirits. Take lacquer thinners. BENTONE 38 gels both . . . and low and intermediate polarity solvents in between.

(3) Ideal for pastel and white paints. The light color of BENTONE 38, plus the lower amounts of gellant required, make it easier to formulate good clean pastel and white paints.

Improves many paints and other products

In standard paints, enamels and varnishes, BENTONE 38 does wonders for brushability, pigment control, film and storage properties. In odorless and other hard-to-gel systems, its bodying is outstanding. In baked finishes it prevents run-off.

"Dutch Boy" BENTONE 38 does as much and more for vinyl dispersion and epoxy or polyester compounds, waxes, adhesives, mastics, cosmetics and non-systemic pharmaceuticals.

Brochure spells out technical details

You can get full technical details on "Dutch Boy" BENTONE 38 in a just-published National Lead brochure. Write for a copy.

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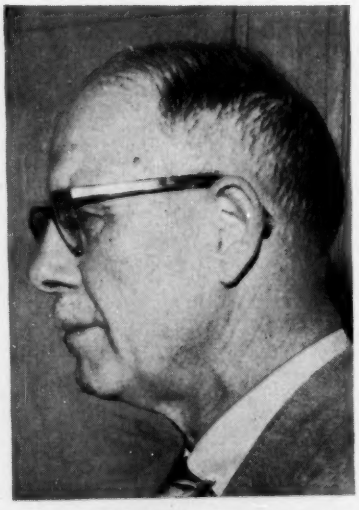
tions, Davison insisted that it could not put fertilizer wages on a par with chemical rates. In the settlement, most of the plant's chemical workers received—including both increases—more than the fertilizer workers gained.

•

Bulging Bankbooks: Employees in various chemical process companies are doing well in stock-purchase matters. Hooker Electrochemical finds that 42% of its eligible employees—considerably above the 26.6% average in other companies—are participating in the company's stock-purchase plan, buying at $39 Hooker shares that have been selling for up to $52 this year. Dow Chemical has just set a price of $60/share—compared with last week's market price of more than $71—on an issue of 150,000 shares of its common stock to be offered to Dow employees this fall. At Du Pont's Chattanooga plant, with 65% participation, employees have accumulated $780,000—25% of which was contributed by the company—in the first year of the company's thrift plan. And at Chicago, President Frank Prior of Standard Oil Co. (Indiana) reports that during the first year of a progress sharing plan, employees put in more than $8 million and the company contributed more than $4 million. Of the total, 89% was invested in the company's capital stock and the remainder in U.S. savings bonds.

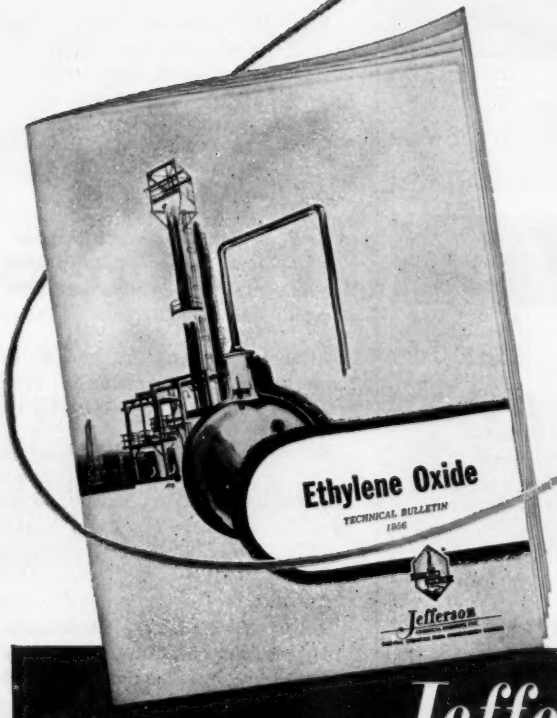


STANDARD'S PRIOR: In one year, employees' savings hit $12 million.

Gathering important data on

JEFFERSON

Ethylene Oxide



Jefferson's new technical bulletin on Ethylene Oxide presents data which you will find both interesting and helpful. This 44-page comprehensive bulletin covers: chemical and physical properties, specifications, analytical procedures, industrial uses, handling and storage, shipping information, engineering and operation of a typical batch reaction, container description, and toxicity. An extensive bibliography is also included.

If you would like to receive a copy, write on your company stationery to **Jefferson Chemical Company, Inc., Box 303, Houston 1, Texas.**

Essential Chemicals from Hydrocarbon Sources

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9-11 Linoleic (Octadecadienoic)
Undecylenic (10-Undecenoic)
Undecylic (Undecanoic)
Heptanoic (Enanthic)
12-Hydroxystearic
Di & Polyhydroxystearic

ALCOHOL
n-Heptanol (n-heptyl)

ALDEHYDE
Heptaldehyde (Enanthaldehyde)

WAXES
Castorwax®
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ESTERS	METHYL	BUTYL	ISOBUTYL	METHOXY ETHYL	GLYCERYL (MONO)	PROPYLENE GLYCOL (MONO)	ETHYLENE GLYCOL (MONO)
Ricinoleate	✓	✓			✓	✓	✓
Acetyl Ricinoleate	✓	✓	✓	✓			
Hydroxystearate	✓	✓		✓	✓	✓	✓
Acetoxystearate		✓	✓				
Undecylenate	✓	✓					

METALLIC SOAPS	ALUMINUM	AMMONIUM	BARIUM	CALCIUM	CADMIUM	COPPER	LITHIUM	MAGNESIUM	POTASSIUM	SODIUM	ZINC
Ricinoleate	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Undecylenate			✓	✓	✓	✓			✓	✓	✓
Hydroxystearate	✓		✓	✓			✓	✓			✓

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KEY CHANGES

Manuel N. Fineman, to technical director, Puritan Chemical Co. (Atlanta, Ga.).

Gerald S. Tompkins, to director; and **Edward T. Powers,** to director, market research and product development; Chemstrand Corp. (Decatur, Ala.).

John F. Daley, to director, vice-president and member of the executive committee; **Samuel G. Baker,** to general manager, Organic Chemicals Dept.; and **John M. Clark,** to general manager, Photo Products Dept.; all of Du Pont (Wilmington, Del.).

James H. Sharp, to vice-president in charge of administrative planning; and **Antonie T. Knoppers,** to vice-president and general manager, Merck-Sharp & Dohme International Division; Merck & Co. (Rahway, N.J.).

Albert W. Rohde, to director, purchasing, Crown Cork & Seal Co., Inc. (Baltimore).

John R. Lofstrom, to manager, Commercial Development Dept., Research and Development Division, The Richardson Co. (Melrose Park, Ill.).

Herman Schneiderman, to technical director, American Latex Products Corp.(Hawthorne, Calif.).

G. J. Keller, to general manager, Canada Sand Papers, Ltd. (Preston, Ont.), a subsidiary of Carborundum (Niagara Falls, N.Y.).

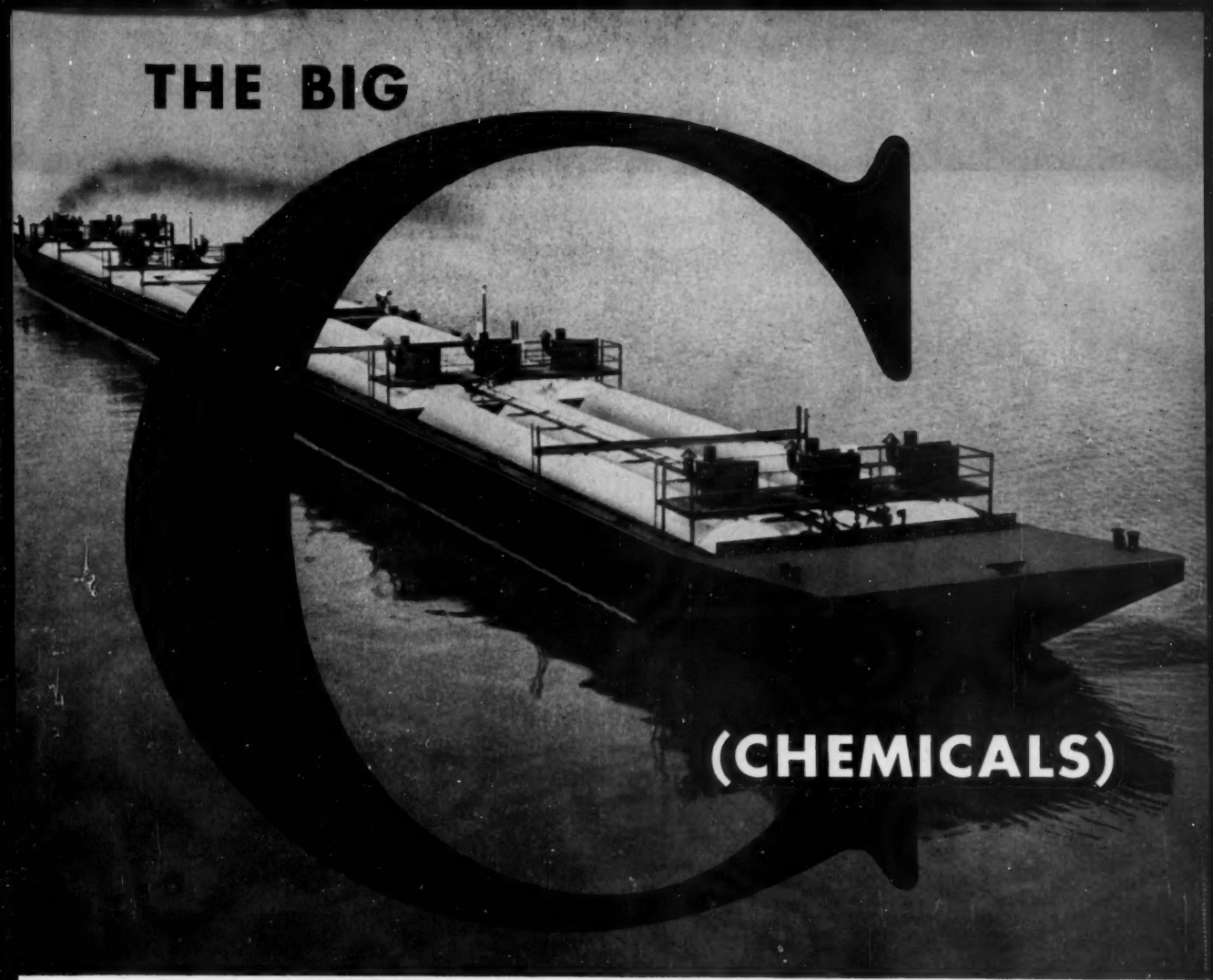
Arthur T. Safford, Jr., and **E. L. Lynn,** to asst. general managers, Film Division, Olin Mathieson (New York).

Robert A. Van Kuyk and **Bernard Willis,** to vice-presidents and directors; and **James M. Barbour,** to secretary; Tar Residuals, Inc. (New York).

DIED

Robert Y. Bradshaw, 83, founder and president, Bradshaw-Praeger & Co. (Chicago), shellac importers and manufacturers, at Chicago.

Elbert D. Peck, 67, vice-president, Paint and Brush Division, Pittsburgh Plate Glass Co. (Pittsburgh), at Pittsburgh.



and INGALLS BARGES

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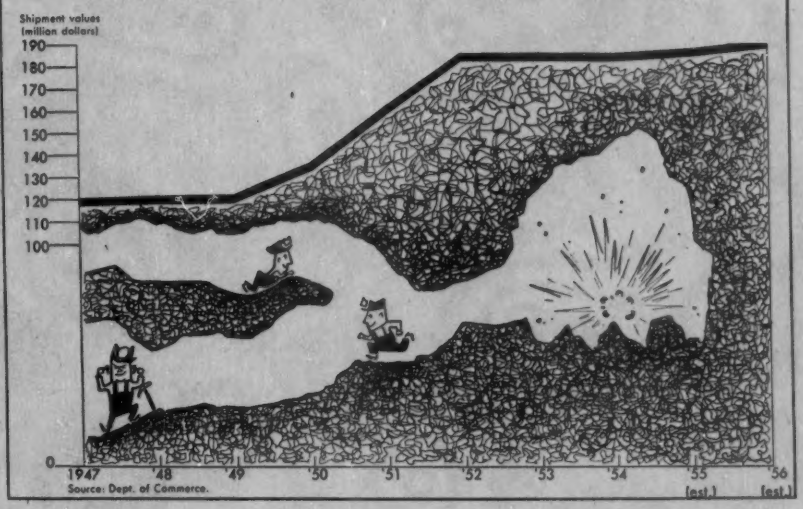
Charting Business

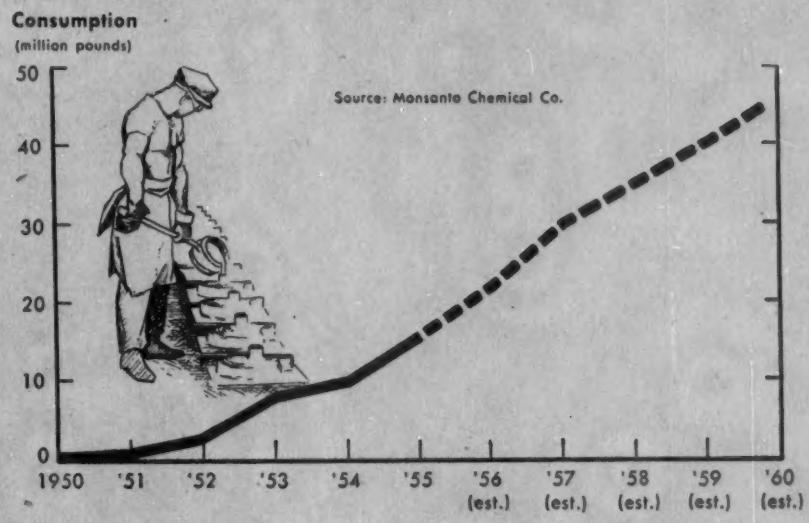
CHEMICAL WEEK
October 6, 1956

EXPLOSIVES SHIPMENTS NEAR $200 MILLION



MANUFACTURERS of explosives—big chemical buyers—are getting a welcomed "shot in the arm" from the current expansion of many industries dependent on blasting materials. Following a slight slump in shipment values in '53 and '54, explosives sales have stepped up briskly, are expected to hit $190 million in '56, as many industries, especially highway construction and coal mining, increase their demand. Approximate breakdown of explosives uses: coal mining consumes one-third; construction, one-fourth; other mining, two-fifths.

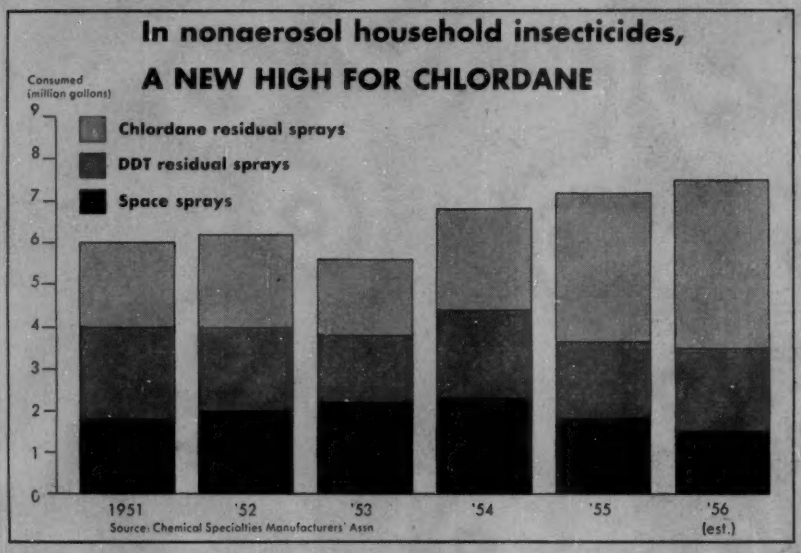
PHENOLIC RESIN CONSUMPTION SOARS IN SHELL MOLDING



METAL CASTING in shell molds, a comparatively new process in the foundry industry, is apparently here to stay. Lowered production costs, improved equipment and better casting techniques assure successful use of resin-coated sands for molds—key to shell-molding technology. And the plastic industry is benefiting. Since 1950, shell molders' consumption of phenolic resins has jumped more than 400%, and an additional 100% gain is expected by '60.

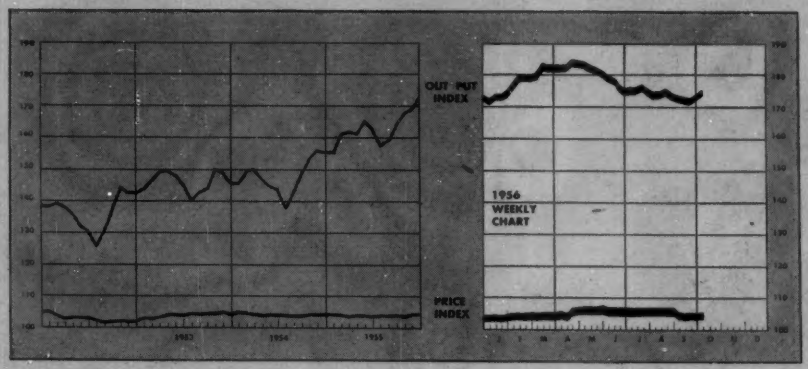
Charting Business

(Continued)



CONSUMPTION of packaged nonpropellent household insecticides this year is expected to hit an all-time high of at least 7.5 million gal. Over 50% will consist of chlordane-type residual sprays such as dieldrin, lindane, etc. Sales of these residual sprays have been rising sharply since 1951, when they represented only 32% of total packaged nonpropellent household insecticide sales. But sales of nonpropellent household space sprays have been losing ground. Today, they account for only 20% of the total, compared with 32% they held in 1951. This slump reflects the shift to aerosol space insecticides, sales of which are up 100%.

BUSINESS INDICATORS



WEEKLY	Latest Week	Preceding Week	Year Ago
Chemical Week Output Index (1947-49=100)	175.1	174.2	165.5
Chemical Week Wholesale Price Index (1947=100)	105.5	105.5	104.4
Stock Price Index of 11 Chemical Companies (Standard & Poor's Corp.)	440.9	448.9	466.2

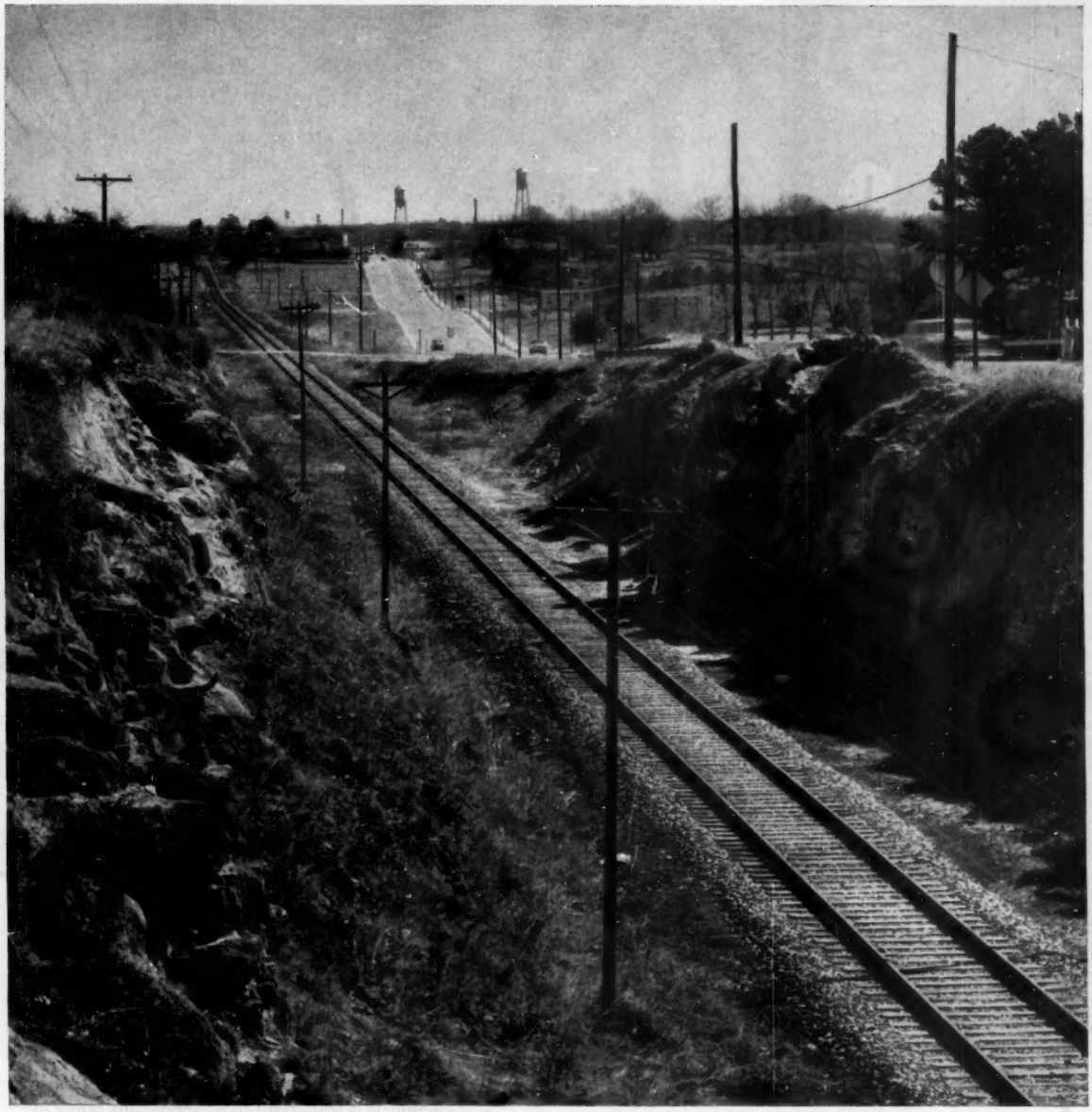
MONTHLY

Production (Index 1947-49=100)

	Latest Month	Preceding Month	Year Ago
All Manufacturing and Mining	141	128	139
All Chemical Products	172	165	163
Industrial Chemicals	191	181	182

Gastonia, N. C. . . . where Dow caustic works for textile manufacturers.

DOW



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DOW

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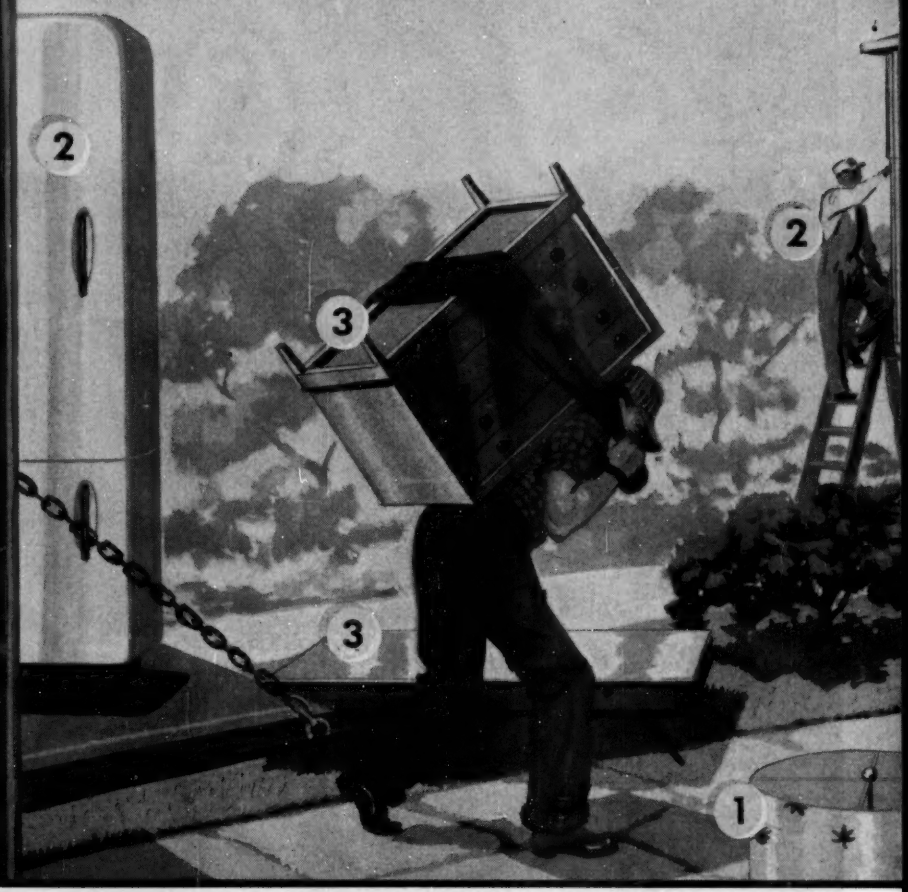


Which of these materials do you need? *Call RCI!*

1 **RCI polyester resins** – reinforced with fibrous glass are used for durable truck vans two to three thousand pounds lighter than comparable metal vans. Other RCI polyesters can be used for colorful modern chairs and easily-cleaned lampshades.

2 **RCI surface coating resins** – are used internationally by leading paint manufacturers to formulate finishes ranging all the way from refrigerator and auto enamels to exterior house paints. Latest addition to the extremely complete RCI line is a series of new melamine resins which give many improved properties to baking enamels.

3 **RCI resin adhesives** – include "hot press phenolics" for water-resistant bonding of exterior grade fir plywood . . . and polyvinyl acetate and urea-formaldehyde furniture glues.

4 **RCI pentaerythritol** – finds an important use today in the manufacture of tough, durable linoleum coatings.

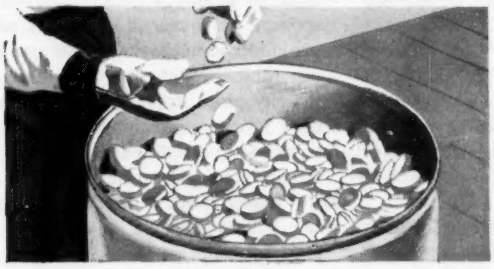
5 **RCI formaldehyde** – like other RCI basic chemicals is important to a tremendous range of industries . . . for tonnage uses and for specialized jobs (waterproofing straw hats and silvering mirrors, for example). RCI's network of plants and warehouses is geared to fill the needs of any user, large or small.

6 **RCI phenolic resins** – are widely used in filler sheets for laminated plastic tops on vanities, tables, counters . . . in molding compounds for plastic furniture drawers.

The next time you have a supply problem (or a technical one), see where fast delivery of these quality-controlled RCI materials (or any of those listed with our signature) can help you.

RCI is in the picture!

MALEIC ANHYDRIDE—Reichhold produces and sells this important basic chemical; and uses it in making POLYLITE polyester resins. RCI MALEIC is available in pellet form as an added convenience.



GREATER PAYLOADS—Exterior, interior and structural members of this insulated van are made by Strick Co. from reinforced RCI POLYLITE. Reichhold operates 3 of these weight-saving vans.

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Phenol • Formaldehyde • Glycerine • Phthalic Anhydride • Maleic Anhydride
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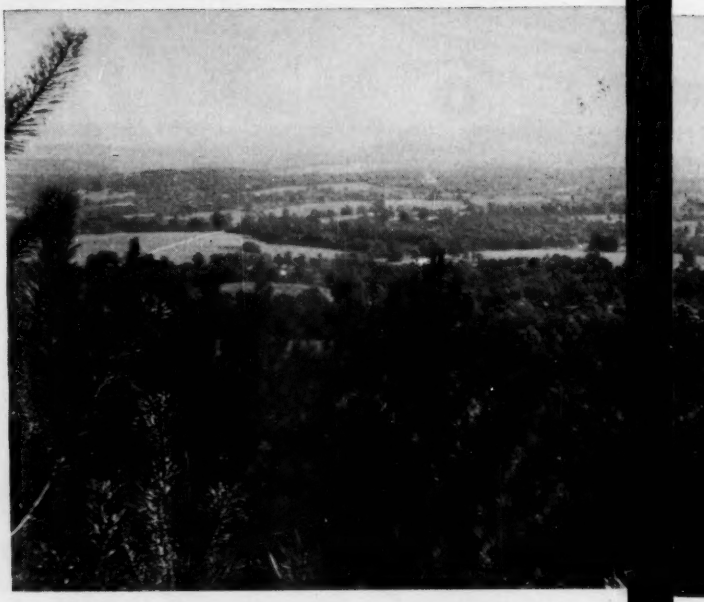
WOODLAND FACTS—

U.S. and coastal Alaska now have:

- **489 million acres of commercial forest land.**
- **47 billion board feet annual growth.**
- **One quarter of all forest land in poorly stocked condition.**
- **More than one-third of commercial forest land in "medium" or "poor" productivity.**

The big job: to boost growth 67% over 1952 to meet demand of 79 billion fbm. by the year 2000.



AIR DROP: Tree fertilization may offer an economical wa

Forests Spell New Fertilizer Opportunity

Millions of acres of North American forests may offer a new and important market to the fertilizer industry. Chemical process firms (including Du Pont, Allied, Consolidated Mining and Smelting, Canadian Industries Ltd.), timber companies, federal and state agencies and universities are all investigating forest fertilization. And Allied will soon launch a multifacet promotional push.

There are many factors behind this spate of interest: nutrient producers see an opportunity to counter currently depressed markets; timber companies seek to boost productivity of forest land; and the government's soil bank program may induce farmers to put marginal land into forests.

Although woodland fertilization has long been practiced in Europe, little has been done in North America. Now, prompted by sudden and heavy interest, the U. S. Dept. of Agriculture's Forest Service is beginning research to answer such basic questions as: "How much growth can you expect from a given quantity of nutrient?"

In the Midwest, USFS is trying to grow hardwood on poor strip-mine soil. In Florida, another project will try fertilizer to boost output of tree seeds. Elsewhere, projects are in progress at universities (Washington, Ohio State, North Carolina State, Rutgers, New York State, Georgia, Purdue and California).

North of the border, Laval University, Canadian International Paper Co., Ltd., Consolidated Mining & Smelting Co., MacMillan & Bloedell and others are also probing what fertilizer will do for woodlands.

State of the Art: Much data (but not all) currently available contain good news for sales development, show fertilizers have markedly beneficial effect on tree growth in "responsive" soils. Some results:

- Washington University's Stanley Gessel reports that annual nitrogen applications of 100 lbs./acre on 10- to 35-year-old fir trees gave an "outstanding and clearly visible" effect, almost doubled the volume of wood produced.
- Research at Crown Zellerbach is angled toward determination of the "ideal" forest soil. Once this is established, experiments to measure the effect of fertilization on forest yield will be set up.
- Laval University's Andre Lafond has developed a lab-scale model forest where years of natural growth can be simulated in a few months by hydroponic methods. Seedling loss can be reduced from 70% to 1%. And seedlings prepared by such means and later transferred to fertilized soil hold promise of reducing planting costs from $30-35 to $20-25/acre in Quebec. Some 2.6 million acres of poor pine and spruce forests along the St. Lawrence, estimates Lafond, could use up to 200 lbs. of potassium chloride, 100 lbs. of magnesium salts and 200 lbs. of nitrogen material per acre.
- At North Carolina State, T. E. Maki is getting promising growth responses on 5-year studies with nitrogen and combinations of nitrogen potash and phosphates on stands of loblolly pine. Applications were made over 3 years, used up to 160 lbs./acre of nitrogen, 80 lbs./acre each of potash and phosphate each year.
- Weyerhauser Timber Co. is trying 100 to 200 lbs. of nitrogen and phosphorus per acre on Douglas firs to boost cone production. Response so far is "quite evident"—cone production is up 100%.
- Recent experiments in Germany indicate that anhydrous ammonia can

to improve forest production.

GROUND CHOP: Culling is a competitive method.

revive the biogenic cycle in raw humus in degraded forest stands. Growth increases of 40-65% over control areas, and added output of 85.6 cu. ft. of wood per acre in 3 years are reported.

Not all reported results are encouraging. Crown Zellerbach, after 5 years of test work, feels that economics of forest fertilization do not look too promising now. For one thing, lumber quality suffers if the tree is forced to grow too fast. But the firm is quick to add that the question isn't settled by any means, that final results are 5 to 10 years off.

Market Potential: Because much experimental work remains to be done and the precise forest acreage that could economically benefit from fertilization is unknown, market estimates are virtually impossible to come by. Greatest potential for fertilizers, experts feel, lies in site rehabilitation, i.e., improving poor or abused land so that it will economically support a forest.

It may never be possible, adds North Carolina State's Maki, to justify forest fertilization on a wood-volume-increase basis. "It is quite possible that no short-term benefits may be demonstrated. Nevertheless, very significant long-term benefits may be shown."

Forest soils most likely to respond economically include:

- Coarse, sandy soils in Southeast.
- Depleted soils in humid areas.
- Land lacking humus or containing inactive humus.
- Ex-farm land accessible to roads and scientific forest development.
- Poor, burned over or cut over land, often in weak "second" growth.

The Northwest, Central and Southeast states have many such areas.

Nationally, some 50 million acres are considered plantable; an added 80 million operating acres are now in low and medium productivity. The U.S. Forest Service believes that fertilizer markets will be best in the Southeast, where pine growth for pulp may be speeded, and barren, sandy soil put to work. Good potential also may exist in the Central states. Future markets in the Northeast—where long-growing hardwoods would tie up an investment for 40-50 years—are debatable, USFS says.

Complicating the market estimates is the need for repetitive treatment. Current work indicates that nutrients will be applied only in the early years of tree growth. And there's good chance that fertilization won't have to be repeated on subsequent stands, once the soil is improved.

Woodland improvement practices, such as the culling of unwanted species, may be competitive to fertilizer use, especially on land that's in relatively good shape. But in some cases, N.Y. State University's Donald White estimates, spending $9-13/acre for fertilizer application may reduce culling costs up to $30/acre by spurring faster closing of the canopy, choking off unwanted tree growth.

Maki estimates that fertilization of perhaps 1.5-2 million acres of the Southeast's 15 million acres of plantable area could be readily justified. Gessel counts "several hundred thousand acres" in Washington alone, more than a million in the U.S. and Canada. To rehabilitate these million acres alone would call for at least 50,000 tons of nitrogen. Such factors total up to a very uncertain market potential. Still, application of 120 lbs. of nitrogen, 60 lbs. of potash and phosphate per acre, in each of six years over a 30-year period (two pine cycles), would mean potential annual sales of 12,000 tons of nitrogen, 6,000 tons of potash and phosphate per million acres.

In view of the currently nebulous state of forest sales development, it's not surprising that some firms (e.g., Shell, Stauffer, Wilson & Geo. Meyer) aren't active in the field. Results, says Shell, are too indecisive, commercialization very distant.

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❸ Spot delivery from convenient warehouses

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FH-100, FH-400, FH-500, FH-600
(99+% hydrolyzed)
Low, medium, medium high and high viscosity fully-hydrolyzed grades.

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SALES

Steps to Sales: Virtually alone, Allied is going ahead with promotion plans. Aimed more at stimulating interest in experimentation than at immediate sales, Allied's drive will include:

- Dissemination of a comprehensive report covering nitrogen use in German forests.
- Distribution of Maki's report on his work in North Carolina.
- Publication of a bibliography containing more than 600 citations.
- Thought-provoking ads in *Time, Scientific American* and *American Forests.*
- Cooperation with farm-fertilizer and forest industry groups in preparing feature stories for publication.

The campaign will blanket the major factors influencing forest research: technical foresters, pulp and timber industry management, federal and state groups, fertilizer industry, and educational organizations (forestry schools). "Fringe influence" groups, such as nursery operators, raisers of Christmas trees and conservation authorities, are also targets. And, an attempt may be made to prod farmers into tree growing.

Like most others, Allied is quick to admit that the path to forest nutrient sales is strewn with many obstacles. There's need for improved application equipment and a woodland distribution system. Undoubtedly, the education of foresters and industry will be slow.

Most pressing, however, says White, is the need for extensive experimentation to give adequate growth, yield and economic data under various conditions.

Clearly, big fertilizer markets in forests are 10-20 years off. But Nitrogen Division's Vice-President Malcolm Hunter hopes to see a "nice development in five years," sales of several thousand tons within a few years. "The economics," he asserts, "are in its favor."

DATA DIGEST

- **Flocculants:** Two new publications, one pertaining to the coal industry, the other to paper and pulp production, describe applications of Separan 2610, a synthetic, organic, water-soluble high polymer. Uses for coal include settling and filtration; uses for paper and pulp cover filler retention, "save-alls" and fluid handling. Dow Chemical Co. (Midland, Mich.).
- **Lithium compounds:** 38-p. loose-leaf folder supplies specifications, solubility data, suggestions for use and shipping information for 16 lithium compounds. Foote Mineral Co. (Philadelphia).
- **Rigid polyethylene:** 24-p. brochure outlines production process, gives facts on the structure, physical properties, chemical resistance, typical applications and processing techniques for Marlex 50, high rigidity polyethylene. Plastics Sales Division, Phillips Chemical Co. (Bartlesville, Okla.).
- **Polyethylene pipe:** 8-p. bulletin describes uses of pipe, gives size information, technical properties and water-flow rates. Supplex Co., Division of American Hard Rubber Co. (New York).
- **Coumarone indene resins:** Bulletin tabulates information on melting points, color, specific gravity and physical form, outlines uses in rubber compounding. Harwick Standard Chemical Co. (Akron).
- **Fatty alcohols:** Fact sheet tabulates physical properties for oleyl, cetyl and stearyl alcohols, and cetyl-oleyl blends. M. Michel and Co. (New York).
- **Plastic tapes:** Brochure offers specifications and use information for cellophane and acetate fiber tapes. Permacel Tape Corp. (New Brunswick, N.J.).

COMPETITION

- Bristol-Myers Co. (Canada) has opened an office and factory at Etobicoke, Ont.
- Commercial chemical development activities of Westvaco Chlor-Alkali have been moved from New York to South Charleston, W.Va.
- Minnesota Mining & Mfg. Co. has established a new product group to sell heat-sealable polyester films to the packaging industry.
- American Gilsonite Co. has selected Allied Asphalt & Mineral Corp. (New York) as distributor for less-than-carload sales of Barber Gilsonite.
- Sequoia Process Corp. (Redwood City, Calif.) has opened an Eastern sales division at Newark, N.J., to handle distribution of plastic-insulated wires and cables.

Now! **FROM STANDARD OIL**

Anhydrous Ammonia—Aqua Ammonia—Nitrogen Solutions

Right now you can contract with Standard Oil Company (Indiana) for Anhydrous Ammonia, Aqua Ammonia and Nitrogen Solutions. Here are six good reasons why you should.

1 **Experienced producer** of petroleum products for 66 years, Standard Oil now turns this production know-how and research experience to the manufacture of Anhydrous Ammonia, Aqua Ammonia and Nitrogen Solutions. You can be sure of Standard Oil as a dependable source of supply. New, modern chemical laboratories assure you of exacting quality control.

2 **Convenient manufacturing plant location** at Hammond, Indiana in the heart of Mid-America is an ideal shipping point. Plant is adjacent to the nation's largest rail and truck center, permitting the greatest possible flexibility of shipment routing for speed and for *your* convenience.

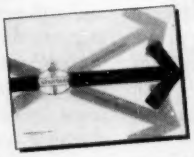
3 **Storage facilities.** Extensive storage for Anhydrous Ammonia, Aqua Ammonia and Nitrogen Solutions are a part of the facilities of the plant. You are thus assured of immediate availability and the immediate filling and shipping of *your* order.

4 **Shipping facilities.** Fleets of tank cars and tank trucks are ready to deliver Anhydrous Ammonia, Aqua Ammonia and Nitrogen Solutions to you. Plant-side trackage permits positioning cars for immediate filling and shipment of *your* order.

5 **Simplified ordering.** As a Midwest manufacturer, chances are you are already a Standard Oil customer for fuels and lubricants. You may thus have an established purchasing continuity with Standard. You may order Anhydrous Ammonia, Aqua Ammonia and Nitrogen Solutions just as easily as you order your petroleum products—and in the same way. Call your nearby Standard Oil office. Teletype facilities or direct phone line will be used to start *your* order moving.

6 **Designed to fit every need.** Standard offers four Nitrogen Solutions, both Commercial and Refrigeration grade Anhydrous Ammonia and Aqua Ammonia. Nitrogen Solutions are:

Nitrogen Solution 410A	(41.0% total nitrogen)
Nitrogen Solution 410B	(41.0% total nitrogen)
Nitrogen Solution 370	(37.0% total nitrogen)
Nitrogen Solution 490	(49.0% total nitrogen)



Find out more about the advantages of ordering Standard Anhydrous Ammonia, Aqua Ammonia and Nitrogen Solutions. Get a copy of this new booklet describing the full line of nitrogen products. In the Midwest, call your nearby Standard Oil office. Or write, Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL COMPANY
(Indiana)

STANDARD

CH-1118

Have You An Odor Problem?

Excerpts from monthly news bulletin sent by RHODIA to its sales and engineering staffs.

AMMONIUM THIOGLYCOLATES

Recent developments abroad indicate that three ALAMASK products are excellent for reducing odor intensity and masking ammonium thioglycolates. Potential users can submit their products for evaluation and reodorization. After tests, recommended formulae will be submitted.

AMMONIA and FORMALDEHYDE

ALAMASK CNG and ALAMASK CNG-X have been reported to us as excellent masking agents for odors traceable to ammonia and formaldehyde. ALAMASK CNG-X will give clear solutions in dilute aqueous ammonia and is generally employed at concentrations of 0.5% to 3%, depending upon the masking requirements.

REFUSE AND WASTES

ALAMASK CNG has also been recommended for use in controlling malodor from refuse dumps and animal wastes. This product imparts a fresh clean fragrance.

These are but a few of the instances where ALAMASK is being used to combat obnoxious malodors, whether they be from processing operations or in end product. Our technical staff is available to work with you on your odor problems.

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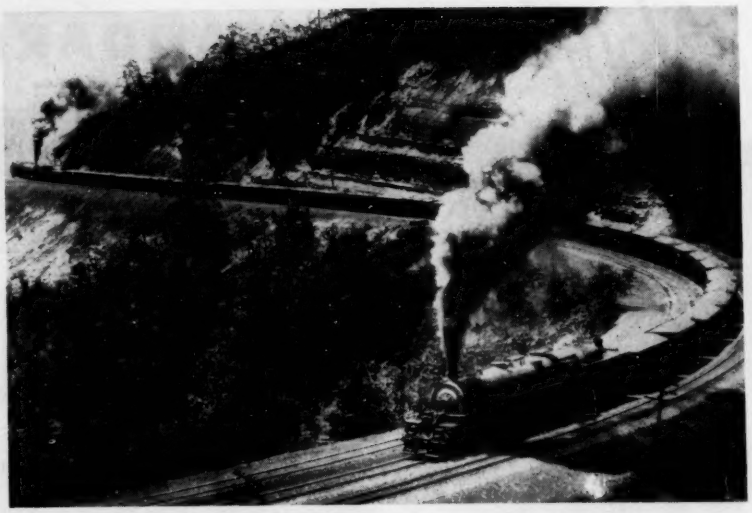
Montreal Toronto Elmira Winnipeg



RAILROADS: Wheezing on the long haul because of higher costs.

Higher-Rates Bid Draws Ire

Chemical shippers are girding for a fight as railroads push their bid to the Interstate Commerce Commission for a 15% general rate increase, lesser hikes on coal and coke.

But chances are that the roads will get most of the increase. Here's the record since '46:

	Railroads asked	ICC granted
'46	24.0%	17.6%
'48	35.8	22.6
'49	12.8	9.1
'52	14.8	12.8
'56	7.0	6.0

Right now, only Eastern and Western railroads are solidly behind the rate boost. Southern lines are holding back until they see how much upcoming wage increases will cost them.

Reasons behind the new request: some $123 million/year of hoped-for extra revenue ($596 million/year) was lost when ICC pared the railroads' rate-increase bid last March from 7% to 6% and granted hold-downs to shippers on some commodity rates. Too, carriers are feeling the squeeze of higher operating costs, rising prices of steel and freight cars. Estimates on how much revenue the 15% hike would bring run as high as $1 billion/year.

Insiders predict that the railroads are in store for a lot more opposition from chemical shippers than was voiced on the bid for 7% last March. At that time, the loudest protest came from coal, agriculture and utilities companies; and they won hold-downs.

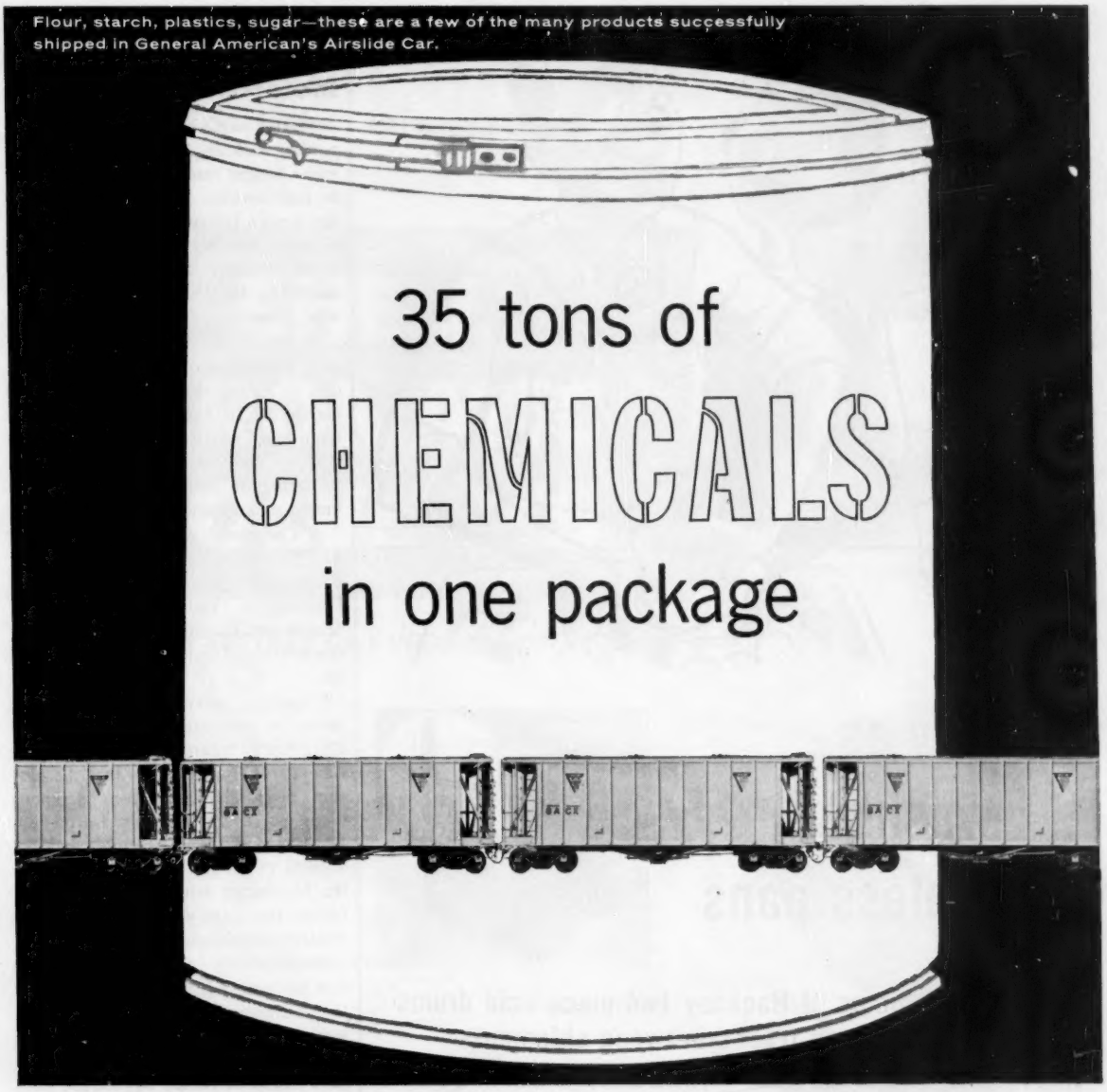
Shippers' traffic men agree that chemical shipments will shift even more to truck and water routes, contract or private carriers. Fewer shippers now hold the view that rail lines are entitled to a hike. Some fear that when Southern lines back the bid, they may push for as high as 25%. A guess is that a 15% boost would up chemical shipping bills about 12%.

"For shipments from New York City," says the traffic manager of one nationwide chemical distributor, "rising freight charges, since '46, have pushed Peoria, Ill., nearly to the Rocky Mountains. Another 15% rate boost would plunk it squarely on Boulder Dam."

Railroads are switching tracks in efforts to get the new hike. Plans this time call for ICC to investigate their earnings and general revenue situation. This, say rail men, will show that the large rate hike is needed to give a modest 5% return on rail investments, and will tend to knock out arguments shippers might raise.

Even so, opine some shippers, railroads may find themselves out of some business for a long time. If chemical companies should sink capital into private waterway facilities, they'll think twice before they abandon them for the lure of lower adjusted freight rates.

Flour, starch, plastics, sugar—these are a few of the many products successfully shipped in General American's Airslide Car.



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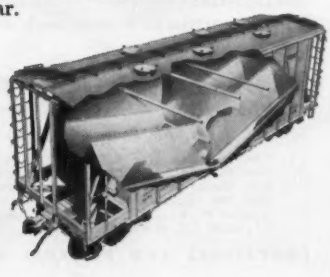

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Here's one reason why so many leading sulphuric acid producers ship in Hackney Acid Drums. Hackney two-piece acid drums are made with entirely *seamless chimes.* They have no interior cracks or crevices where acid traces can linger and carry on intensive corrosion between shipments. Controlled heat treatment further increases corrosion resistance of selected, top-quality steel. Meet ICC specifications for the safe transportation of corrosive liquids such as sulphuric acid, aqua ammonia, titanium tetrachloride, caustic potash and many others.

Rugged and Durable—Take shipping and handling abuses on the chin thanks to such construction features as reinforced chimes, sturdy I-bar rolling hoops, heavy forged spuds. Standard capacities of 15, 20, 30, 55 or 110 gallons. Send today for Drum and Barrel Catalog and minimum quantity data.

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Hackney DOWNINGTOWN IRON WORKS

CONTAINERS AND PRESSURE VESSELS FOR GASES, LIQUIDS AND SOLIDS

Motor-Water Fracas

West Coast chemical process companies, looking forward to a motor-water freight rate reduction, will have to wait awhile. That's the upshot of last week's Interstate Commerce Commission decision that suspended for seven months a new, lower tariff sought by the Pacific Far East Coastwise Line.

It sought these revisions:

- Reduction of the rate for chemicals in 55-gal. drums from $1.98/100 lbs. to $1.70/100 lbs. for shipments from San Francisco, Oakland and Los Angeles to Seattle and Tacoma. In addition, the new rate would include motor pickup and delivery service.
- Combined motor-water tariff of $1.03/100 lbs. for chemicals in 55-gal. drums moving between Martinez and Dominguez, Calif., and Portland, Seattle and Tacoma. The current Martinez-Portland rail rate is $1.40/100 lbs.

Truckers charge that PFECL's move is evidently a bid for Shell Chemical's business. Pacific Coastwise Tariff Bureau states that the new rate proposals stem from demands made by several shippers. Surprisingly, however, Shell claims that its volume of 55-gal. drum shipments to the Northwest would have to increase before the rates would become "particularly significant."

Rail carriers did not protest the first revision. But when PFECL posted the Dominguez-Portland rate three weeks later, railroads petitioned ICC to suspend the tariff, complaining that rails would be forced to "reduce rates on a great variety of chemicals" to compete. Such policies, argue railroaders, run counter to national transportation policy.

In suspending the new rates, ICC ruled that they might result in "unfair and destructive competitive practices."

PFECL's course of action is now uncertain. The line will probably ask to withdraw the tariffs, publish a new one listing chemicals by name rather than by number. If there is even slight hope of eventual victory, PFECL will fight.

If no ICC action comes by April 24, '57, then the proposed rates automatically go into effect.

Next step in the controversy is to set a hearing date; so far, ICC doesn't know when that will be.

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SHELL AROMATIC SOLVENTS

with wide variety of evaporation ranges

These Shell solvents cover a very wide evaporation range. Their individual characteristics satisfy specific requirements in a great variety of formulations. Detailed specifications are given in a booklet which will be sent upon request.

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SHELL TOLUENE

. . . for applications where very fast evaporation and high solvency are required.

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. . . has an exceptionally narrow distillation range, is slower drying than toluene.

SHELL CYCLO-SOL 53

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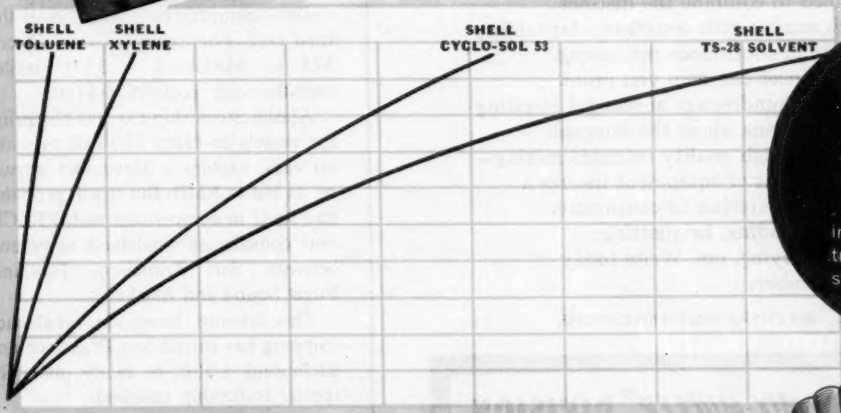

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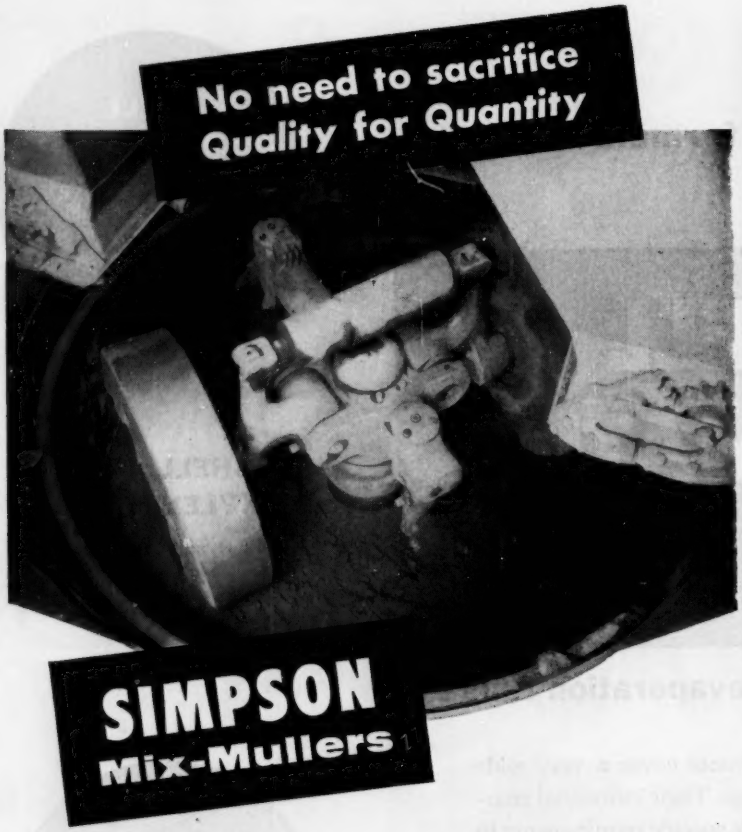

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If you've had experience with continuous mixing you may have found that speed was gained *at a loss* in quality, at a high cost in equipment. That's why the Simpson Mix-Muller is designed to combine the distinct advantages of batch mixing with complete adaptability and flexibility for use in continuous processing.

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SALES

'Whalebacks' West

Expect a bustle of activity in West Coast ports in the not-too-distant future. Shipping lines are pushing plans for a new operation. It's been tagged "whaleback," or "roll-on roll-off," service, involves special ships to carry trailers, vans and tank cars. And the carriers have their eye on chemical shippers.

Forerunner in prospective whaleback shipments is Pacific Trailerships, Inc. Right now, PT is waiting for the nod on its operations from California's Public Utilities Commission. When it comes, PT will get $25 million from Eastern interests, and will ask for federal help, too.

PT isn't the only line with this idea. Others: Pacific Far East Coastwise Line, McLean Interests of Mobile, Ala. (Pan-Atlantic Steamship Co.), Alaska Steamship Co., Hawaiian shippers. According to the Federal Maritime Board, there were applications for federal mortgage insurance on 35 ships as of mid-'55. FMB may, in certain cases, underwrite up to 87.5% of cost of "whaleback" facilities.

Now, there's no true whaleback service on the West Coast, although some trailers and vans travel on regular cargo ships. But that's uneconomical* when there's higher-profit deck cargo around.

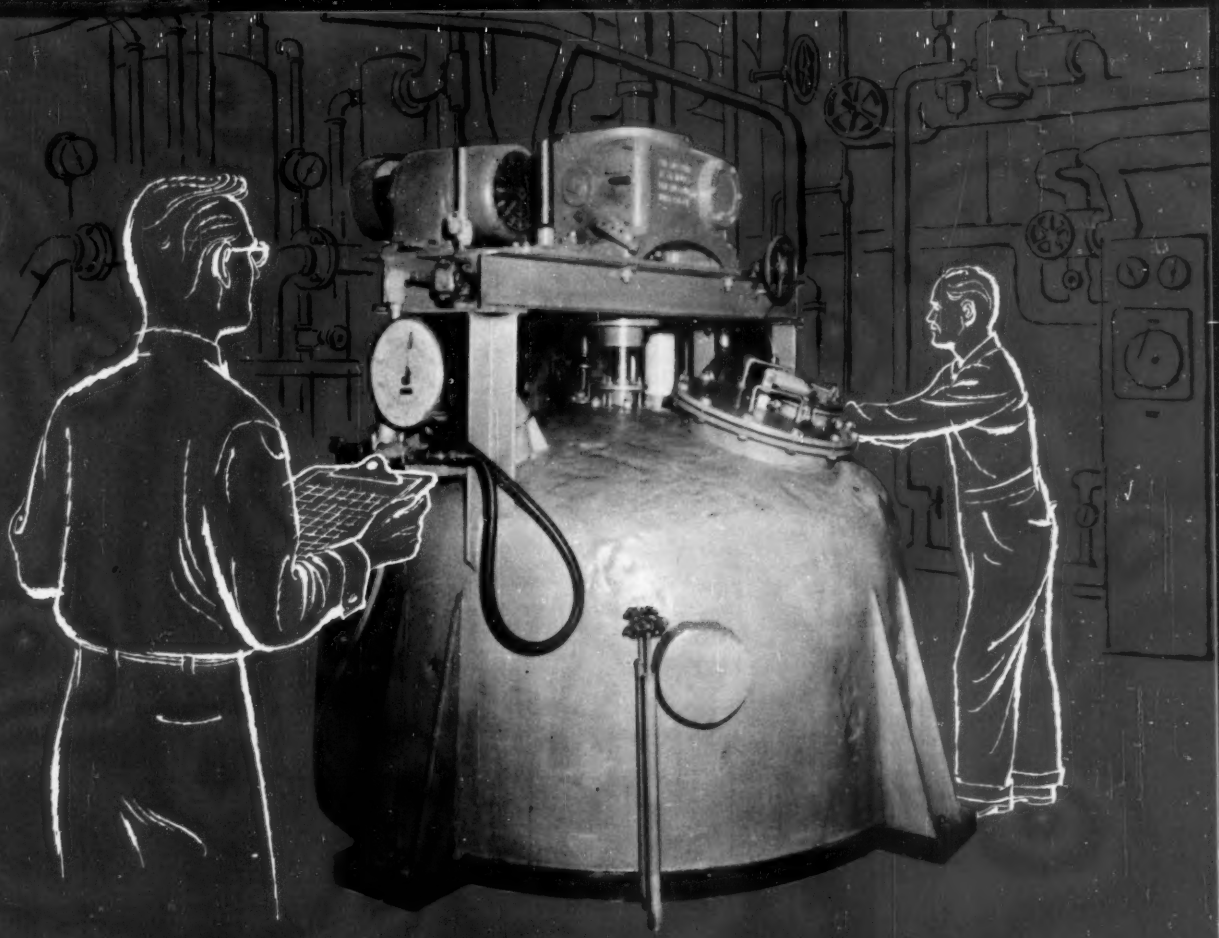
PT plans whaleback service between San Francisco and Los Angeles, is prepared to build two $10-million ships that would make the run in 18 hours. Proposed rate: $2/linear ft. of trailer—competitive with over-the-road cost. For example, it might cost $75 to whaleback a 35-ft. trailer, over-the-road cost: $75-$100.

Alaska Steamship Co. has blueprints for vessels to carry 110 rail cars and 40 vans, expects a November answer on its bid to FMB. But it will probably find itself in competition with PFECL, now considering whaleback shipments between San Francisco, Portland, Puget Sound and Alaska.

The coming boom in whaleback shipping has stirred San Francisco and Richmond, Calif., to ready plans for special trailership terminals.

Add to all this FMB's ardent support, and chemical shippers can look for new and bigger routes to markets.

*One approach is to build false decks on tankers; another is to build LST-like vessels with drop noses to unload directly onto depressed piers.



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who knows **process chemicals**

he thinks of Mallinckrodt first for fine chemicals

but, he may not know that . . .

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In addition to making laboratory reagents and prescription chemicals which are usually put up in small bottles, by far the major share of Mallinckrodt's business is in ***bulk chemicals*** — ton lots, carloads, millions of pounds . . . serving more than 200 industries.

Make no mistake — we're proud of the nation-wide reputation Mallinckrodt fine chemicals have earned among pharmacists and laboratory chemists.

But, if you are *not* one of the many chemists, chemical engineers or production managers who are now specifying Mallinckrodt industrial chemicals, we want to remind you that ton lots . . . carloads . . . millions of pounds of *process chemicals bear the same Mallinckrodt label guarantee* of uniform, dependable purity which will improve *your* process and cost you less.

MALLINCKRODT'S TECHNICAL KNOW-HOW AND FACILITIES HAVE SOLVED MANY PROBLEMS

Mallinckrodt Pioneered the First Commercial Production of

URANIUM OXIDE FOR THE ATOMIC ENERGY ERA

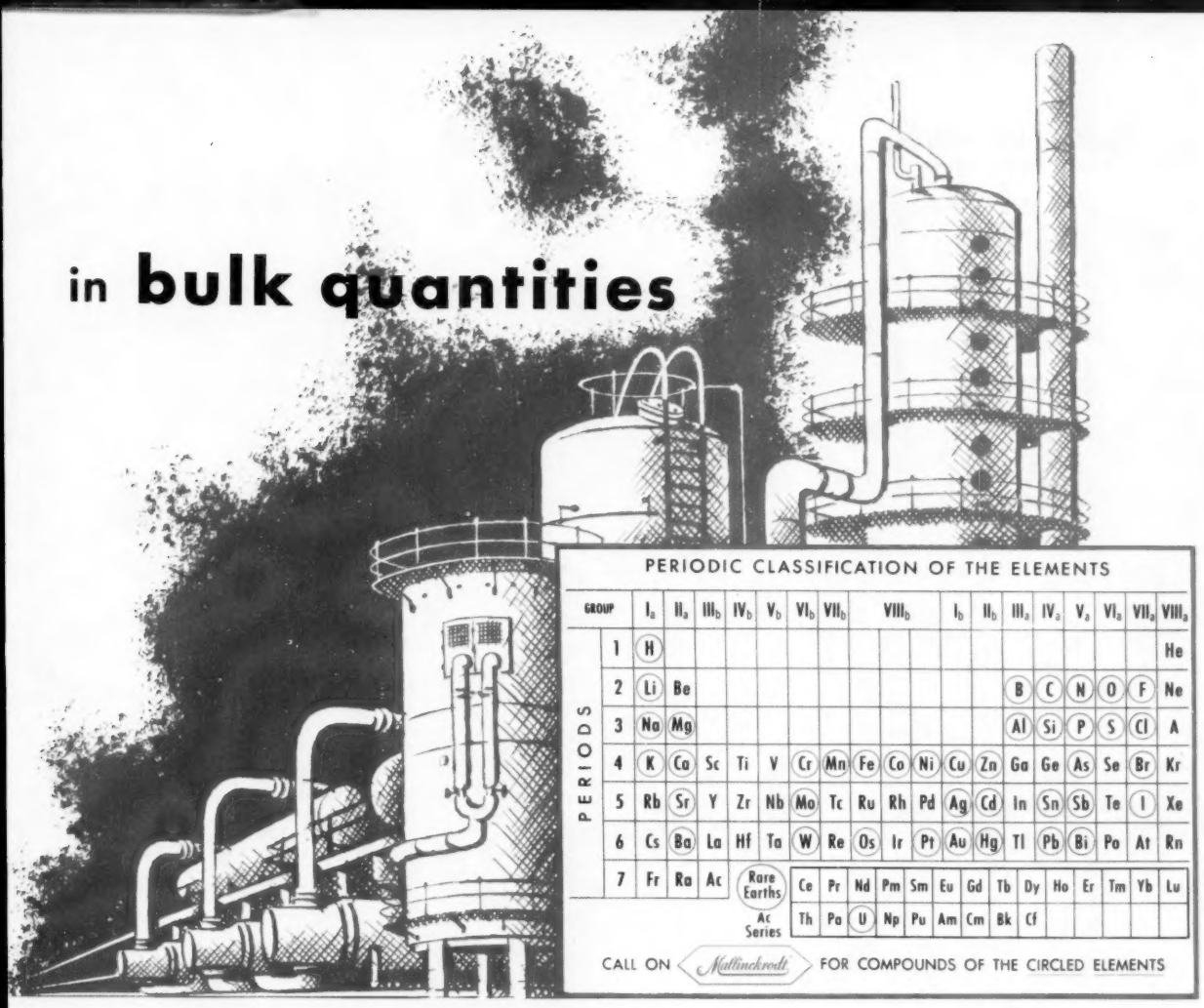
In April 1942, Mallinckrodt — because of its excellent facilities and reputation for producing pure chemicals — was assigned the job of refining crude uranium ore for the Manhattan Project. At this time it was known that ether extraction could be used to provide pure uranium oxide on a small scale, but large-scale production was necessary.

Mallinckrodt, calling on the resources of its skilled chemists, scientists and a few outside sources, in 15 weeks time designed, built and put into operation a new commercial plant and started delivery of pure uranium oxide *in quantities of one ton per day.*

Later, the Smyth report recorded: "Delivery started in July 1942 at the rate of 30 tons a month . . . it was a remarkable achievement to have developed and put into production on a scale of the order of one ton per day a process transforming grossly impure commercial oxide to oxide of a degree of purity seldom achieved even on a laboratory scale."

Since 1942, Mallinckrodt has been a major producer of uranium for the Atomic Energy Commission. Today, Mallinckrodt is more active than ever in this field. Facilities have been enlarged at the St. Louis plant and in 1957 Mallinckrodt will be operating a new $30,000,000 plant for the AEC at Weldon Spring, Missouri.

in **bulk quantities**



PERIODIC CLASSIFICATION OF THE ELEMENTS

GROUP	I_a	II_a	III_b	IV_b	V_b	VI_b	VII_b	$VIII_b$			I_b	II_b	III_a	IV_a	V_a	VI_a	VII_a	$VIII_a$
PERIODS 1	H																	He
2	Li	Be											B	C	N	O	F	Ne
3	Na	Mg											Al	Si	P	S	Cl	A
4	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
5	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
6	Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
7	Fr	Ra	Ac															

Rare Earths	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
Ac Series	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf					

CALL ON Mallinckrodt FOR COMPOUNDS OF THE CIRCLED ELEMENTS

PROGRESS THROUGH CONTINUING RESEARCH

Television tube and fluorescent light manufacturers, food processors, beverage manufacturers, battery producers, paint and varnish manufacturers, paper mills, oil and grease producers, photographic and graphic arts industries are only a few of the more than 200 industries that look to Mallinckrodt for service and the right chemicals for trouble-free and profitable large-scale production.

A few of the many chemicals Mallinckrodt manufactures for American Industry:

Acid Citric
Acid Gallic
Acid Pyrogallic
Acid Silicic
Acid Tannic
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Aluminum Chloride
Aluminum Stearate
Ammonium Chloride
Ammonium Sulfite
Barium Acetate
Barium Carbonate
Barium Sulfide
Cadmium Carbonate
Cadmium Chloride
Cadmium Nitrate
Cadmium Sulfate
Calcium Carbonate
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Iodine
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Manganese Carbonate
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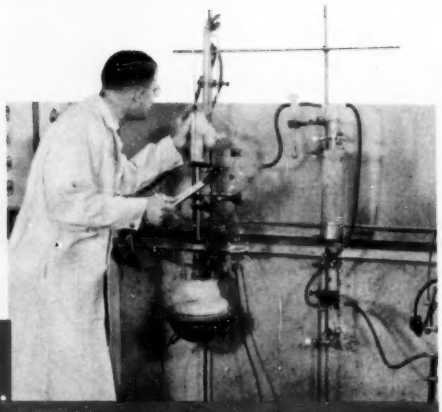
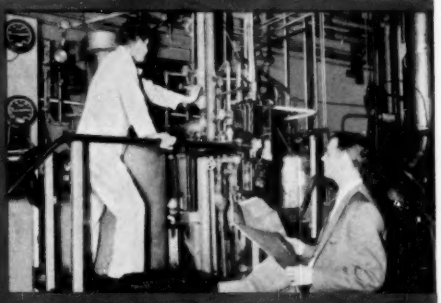
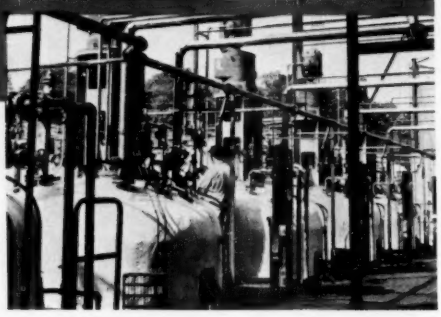


in pilot plant.....



in full-scale production.....



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WOMEN IN RESEARCH: Once it was a rarity, but now women comprise 5% of all researchers in the chemical process industries. They are particularly abundant in pharmaceutical and cosmetic research.

Management Makes Way for the Ladies

When you talk manpower to research directors today, you'd better include womanpower too. Women now comprise about 5%* of the chemical process industries' research force, and this percentage is on the increase.

There's no discounting women's success in the chemical process industries as chemical analysts, computer operators, quality-control technicians, microchemists, technical writers, patent searchers and technical librarians. Now women in increasing numbers are finding their way into applied and basic research and process engineering.

*Manufacturing Chemists' Assn. estimate.

That reflects quite a departure from the once widely held attitude among research managers that "we don't want women under any circumstances." Giving way is the traditional fear of the female "temperament" and of high personnel turnover among the ladies.

A recent American Management Assn. seminar in Chicago on "Selection and Training of Research and Development Personnel" underscores this kindlier attitude. A 15-firm committee of this group produced the unanimous verdict that women make good researchers. Consensus: competence is more a matter of training than of sex.

And there's evidence that more chemical process firms are coming around to this point of view.

At the Toni Division (Chicago) of the Gillette Co., Raymond Reed, vice-president in charge of technical research, avers: "We use women in all branches of our research work. At the moment, about 46% of our staff are women . . . a strong representation, considering the ratio of men to women in the technical and professional fields."

"In our field," Reed continues, women appear to surpass men by their ability to manipulate hair samples. . . . The chemistry of hair appears to be a field in which women are

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DRUG LAB STAFFERS: Patience and meticulousness are traits that play a big part in the success of women in the laboratory.

able to do a satisfactory—even outstanding—job."

He finds there's an advantage in having the woman's viewpoint, which may extend beyond the technical area. In other words, women do a better job in this field because they're more interested in the end-product.

Smith, Kline & French Laboratories (Philadelphia) employs women in both research and development. And Stanford Research Institute (Palo Alto, Calif.) reports that it hires women researchers of all types. Its staff includes women chemists, mathematicians, statisticians, bacteriologists and electrical engineers—all doing applied research. Also included are women editors, librarians and research economists.

SRI doesn't hire women merely to fill in during the manpower shortage. They are hired for specific positions where they have superior qualifications or can be expected to do a better job than men.

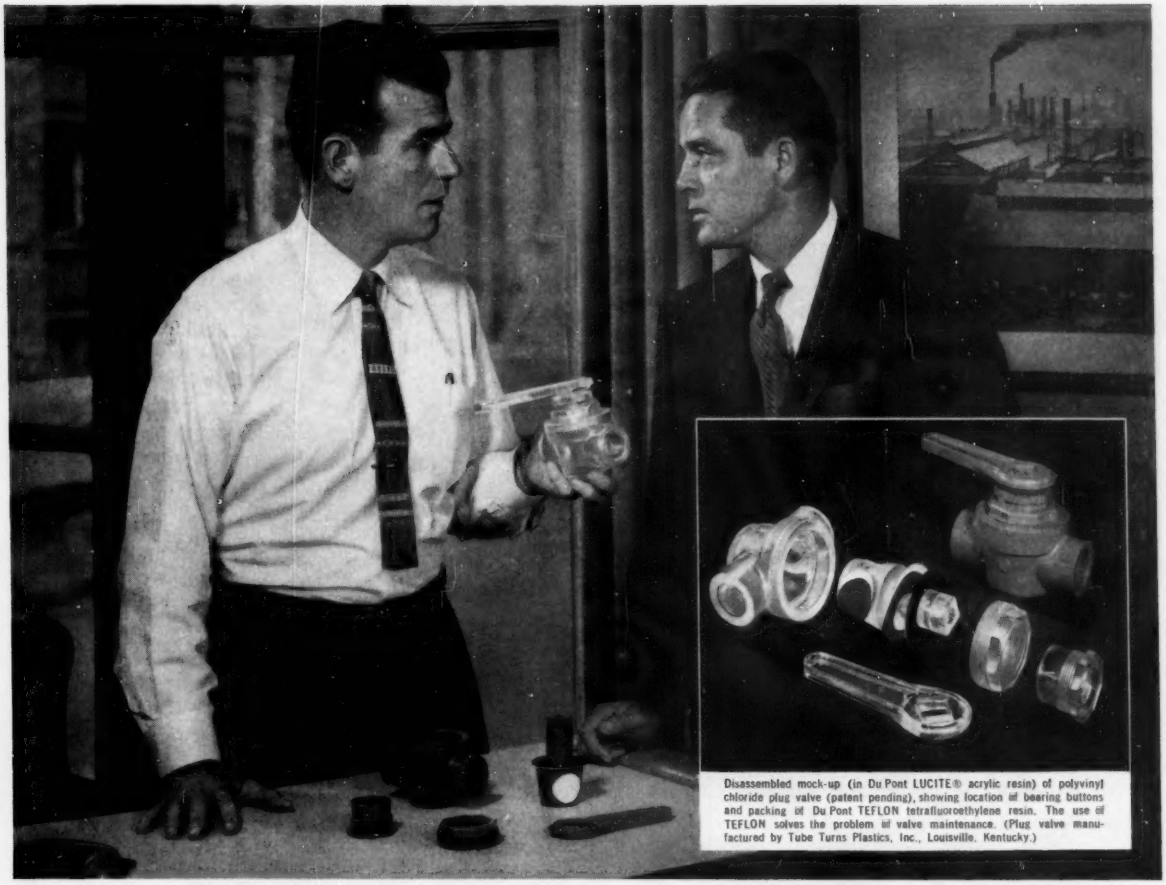
And Sharp & Dohme (Philadelphia), division of Merck, employs women at various research levels, estimates that about 10% of its staff are women.

Place for Nonprofessionals: Women without college degrees are also finding a place in research as laboratory assistants. Generally, they help in analytical work (titrations, weighings) and organic preparation. Most firms demand at least a high school education for such work and prefer to find women with at least one or two years of college. One firm reports that women are fully as efficient in these jobs as men.

Management and Muscle: A Midwestern firm that has women researchers on the payroll says that the disadvantages of employing women are fairly obvious: very few continue to work for any appreciable length of time after marriage. The research director of this company states his problem this way: "We invest a lot of money in the training of researchers and, as a rule, they're not really competent until after two or three years. . . . So we often fail to get full value out of our women researchers."

But some companies have a different view. They admit that impending motherhood is the major cause for women leaving. But, these firms say, women leave to have babies no more often than men leave to take other jobs. In fact, companies that grant maternity leaves report that women turnover is relatively low.

A common argument against women in industry is that they are harder to manage—supervisors can't deal



Disassembled mock-up (in Du Pont LUCITE® acrylic resin) of polyvinyl chloride plug valve (patent pending), showing location of bearing buttons and packing of Du Pont TEFLON tetrafluoroethylene resin. The use of TEFLON solves the problem of valve maintenance. (Plug valve manufactured by Tube Turns Plastics, Inc., Louisville, Kentucky.)

Here's how Du Pont TEFLON® can cut replacement costs and downtime

TEFLON tetrafluoroethylene resin enables these pvc plug valves to handle a wide variety of corrosive fluids efficiently and economically. Valve specifications call for resistance to corrosive liquids at 125 psi and 75° F. Bearing buttons of TEFLON are specified to provide a permanently "self-lubricated" spindle bearing surface and chemically inert valve facings. TEFLON is also used as a packing around the spindle shaft, forming a permanent seal against external leakage. The combination of chemical inertness and surface lubricity inherent in Du Pont TEFLON results in a valve which greatly reduces maintenance.

This valve has been operating for more than a year in concentrated HCl at room temperature. The user reports that no problems of corrosion, sticking or lubrication have occurred at any time so far.

Du Pont TEFLON remains tough and resilient, even at extremely low temperatures, and is suitable for use up to 500° F. TEFLON is non-flammable and does not absorb water. Materials of a sticky or viscous nature do not adhere to its wax-like surface. Use of TEFLON for parts such as valve seats, gaskets, and components of pumps, agitators and mixers often results in the large economies of low maintenance and low downtime costs.

TEFLON tetrafluoroethylene resin is inert to nearly all chemicals and solvents normally used in commercial practice. Exceptions to this are molten alkali metals. At elevated temperatures and pressures, halogens and certain halogenated chemicals and solvents may affect TEFLON.

Send for additional facts to evaluate Du Pont TEFLON in terms of your own application.

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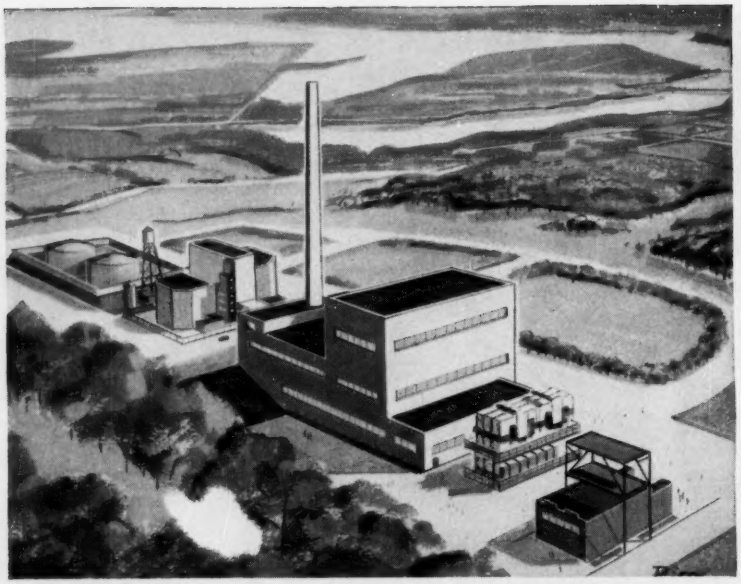

Preliminary Concept of Con Edison's Nuclear Power Station

engineering the atomic age...

AN outstanding new example of Vitro Engineering Division's leadership in atomic energy is participation in Consolidated Edison's nuclear power station at Indian Point, N. Y., which has received Civilian Construction Permit #1 from the A. E. C.

Since late in 1954 Vitro Engineering has served as nuclear consultant to Con Edison. Now, as the project moves into design and construction its role has broadened:

- Vitro has been awarded the contract for general design on the non-nuclear portion of the huge complex at Indian Point.
- The Babcock & Wilcox Company, builders of the Indian Point reactor, has awarded Vitro a contract for architect-engineer services on the reactor building.

Vitro Engineering leadership in nuclear engineering is also shown by:

- Its selection as architect-engineer for Lockheed Aircraft Corporation's atomic aircraft research center at Dawsonville, Ga.
- Provision of conceptual design for two new types of research reactors for the Army Corps of Engineers at Fort Belvoir, Va.
- Preliminary design of heavy water plant for the Government of India.

The selection of Vitro to handle these key projects, and others, reflects solid performance in modern nuclear engineering design.

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with them as directly and bluntly as they can with men. Nor, it is often heard, can women take criticism as well as men; women are said to be prone to regard criticism as evidence of prejudice against their sex.

How valid these charges are, or how much of a problem they constitute for the research manager is difficult to assess. Clarence Larson, research director of National Carbon (New York), division of Union Carbide and Carbon Corp., is one highly placed executive who feels they should not be a permanent bar to women in industrial research.

It's also said that women researchers are not as aggressive, do not have as much imagination nor as intense an interest in their jobs as do men.

Most research executives agree on this, but one of them reasons it out this way: "That's not their fault. Our basic social structure just doesn't encourage women to develop professional careers with the same intensity as men."

There are, of course, less abstruse reasons why women are at a handicap. They haven't worked out too well in the pilot plant, for instance, where a certain amount of physical effort is required. But even here they're making gains. Monsanto's Organic Chemical Division (St. Louis), for example, now has a woman chemical engineer making process studies.

They Ask Less: Although rates of pay vary, in most cases starting salaries for women in the chemical process industries are now equal to those for men. But when it comes to experienced researchers, one firm frankly admits that salaries paid women are generally lower than those for men with comparable experience. This company feels that professional salaries are still a matter of bargaining and market conditions—and women expect and ask for less.

Salary potential for women is limited in another way: often no allowance is made for advancement to supervisory positions.

Many companies are considering women researchers in their hiring plans. And more women than ever are seeking research jobs. Research management men in all walks of the chemical process industries may soon have considerably more experience on which to debate the pros and cons of lady researchers.

they both had a big night

She and her classroom. She painted the town pink last night. And now, back with her class this morning, she finds the room had a big night, too. Painters were in. The whole room is painted, bright and clean to match the scrubbed faces and bright spirits of her youngsters.

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Tranquilizer Stalemate

To the 700 or more experts—who gathered* in Washington for the recent national conference on pharmacotherapy in mental illness (CW Technology Newsletter, Sept. 29)—it's now plain that a lot more must be known about tranquilizers before guides for their research and development can be established.

National Institute of Mental Health put up $40,000 to bring the scientists together, set for them the task of formulating the evaluation program that NIMH will launch soon (through its newly established psychopharmacotherapy research center) on tranquilizers and other chemotherapeutic agents for treating the mentally ill.

While the thoroughness with which manufacturers have tested the new drugs for toxicity elicited praise from conferees, psychiatrists and medical scientists were critical of their progress to date in correlating the influences of tranquilizers on animal and human behavior.

Additional facts learned:

- Quick, authoritative explanations of conflicting claims for the effectiveness of the drugs (*CW, June 9, p. 111*) seem out of the question. Five or 10 years may be required before NIMH can obtain valid data on how the drugs function and the possible risks of their extensive use.
- There's little likelihood that NIMH will put its major effort and funds into a single, large-scale hospital evaluation project—a centrally directed "crash program." Physician Jonathan Cole, who will head up NIMH's psychopharmacotherapy research, reported to delegates that "trying to crack the problem by brute financial strength is not the solution." Cole is noncommittal about the prospect of NIMH, itself, drawing up the rules on use of the new drugs.

That still leaves unfilled two major needs of the tranquilizer makers: (1) Improved methods of selecting compounds for clinical trials and sale; (2) for NIMH or an equally authoritative and disinterested organization to take a stand on promulgating rules that will give manufacturers and physicians protection against lawsuits by users claiming injury from the chemical calmers.

*Under the joint auspices of the National Institute of Mental Health, National Research Council-Academy of Sciences, and American Psychiatric Assn.

Inco high temperature research note:

Nitriding

...and its effects on several heat-resisting alloys

As a constituent of many hot atmospheres that employ air for combustion, nitrogen in molecular form is usually considered substantially inert to a large number of metals and alloys.

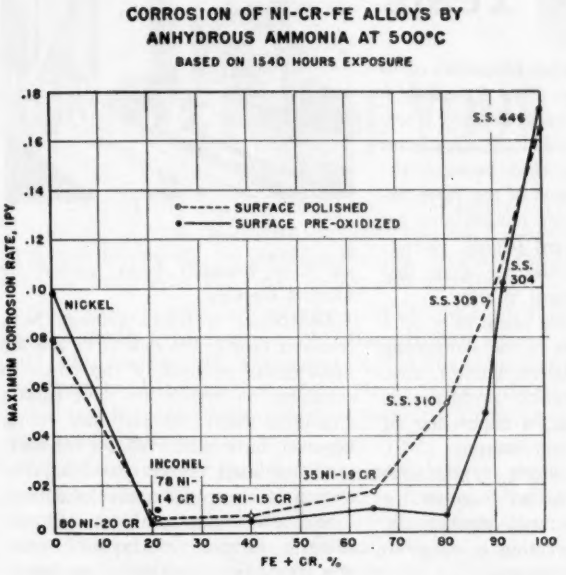
However, in atomic state—for example, as a transient dissociation product of ammonia – nitrogen may react with surfaces of certain metals and distinctly alter their properties. Whether this may be desirable or not, depends on extent and nature of the reaction.

The Problems

Industry heats steels to be intentionally nitrided, in a freshly dissociated ammonia atmosphere to attain the surface hardening that accompanies formation of nitride phases. But the problem is, to avoid nitriding the furnace chamber, dissociator and other accessories . . . a costly and useless consumption of gas. Another problem exists in chemical plants, where equipment handling hot ammonia must resist the absorption of nitrogen. Here nitriding is a form of high temperature corrosion requiring selection of the most resistant alloys for its prevention.

A Postulate

Field experience had shown that alloys high in nickel resist corrosion and embrittlement by nitrogenous atmospheres. However, to evaluate lower nickel alloys



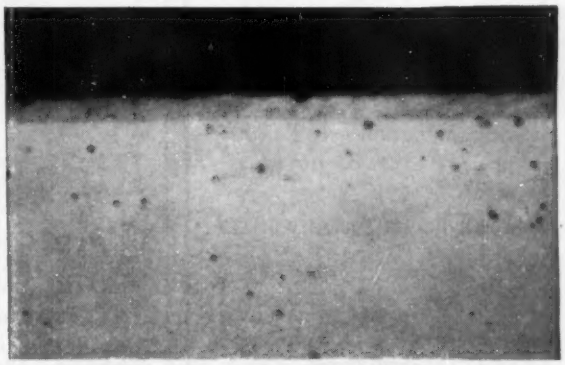
in this type of service, a series of commercial compositions was exposed in a plant ammonia line and the corrosion behavior thereafter compared.

Examination

After 1540 hours' exposure at 500°C, stainless steels having initially a bright surface suffered heavy corrosion that was quantitatively measured by examination of the specimen cross section under the microscope. These measurements were calculated in terms of "inches penetration per year" and the variation in extent of attack with alloy composition is shown in the graph.

When the nickel content is high, as in 80 Ni/20 Cr, 78 Ni/14 Cr (Inconel* nickel-chromium alloy), or 59 Ni/15 Cr, the nitride phases which form are dense and adherent and the corrosion resistance is correspondingly good. Alloys that contain more iron develop porous surface layers and the rate of attack is high. Significantly, apparently some chromium is required to provide corrosion resistance, since under these conditions of exposure, pure nickel is inferior.

An interesting observation from this test is that the stainless steels which were initially heat-treated to form an oxide film were more resistant than specimens with a bright surface.



Material Magnification dark zone nitride rich corrosion layer.

Result of Investigation

Quantitative data obtained from this test in general support past experience that the high nickel compositions are inherently suited for service under nitriding conditions.

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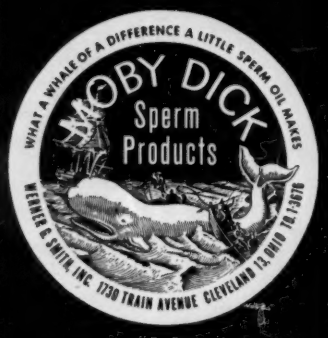
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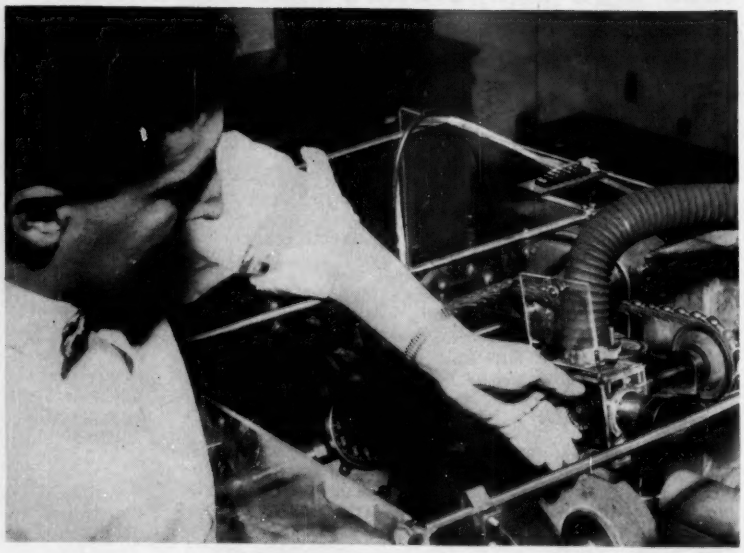

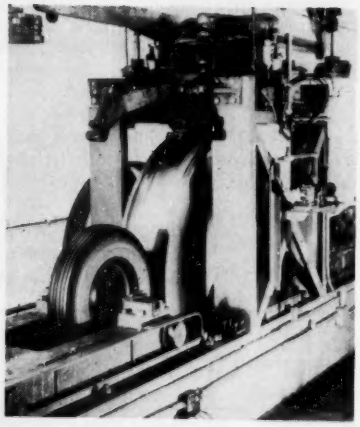

Butyl Tires Ride Out Torture Tests

To test the wearing properties of its new all-butyl tires, Esso Research & Engineering Co. used abrasive "torture wheels" on miniature tires, such as the one being held between the thumb and forefinger of the researcher *(above)*. Full-scale models also got the same punishment *(right)*. Found: Better abrasion resistance than that of GR-S and natural rubber.

The new tires are made at a pilot plant Esso operates at the Armstrong Tire Co. (West Haven, Conn.). Esso says it is not having problems in working the rubber, a copolymer of isobutene (98%) and isoprene (2%). Atlas Supply Co., which supplies tires and auto accessories to Esso service stations, probably will market the new tire. Test marketing is slated to begin in about six months.

If and when butyl tires become generally available, there's a good chance that U. S. Rubber will be making them. U.S. Rubber is the major producer of Atlas tires; and Esso leaned heavily on U.S. Rubber's know-how in its tire work, although principal credit for the butyl tire belongs to an Esso research team headed by Donald Buckley.

Developed at Esso's Linden, N.J., research center, the new tires are the most recent product of the effort to capitalize on butyl's low cost (about 23¢/lb.). Butyl rubber inner tubes, however, have been available for some time. All-butyl tires are said to offer several advantages over tires of natural rubber and other synthetics: shorter stopping distances, less noise of operation (butyl tires don't squeal on rounding corners), and better resistance to ozone. Butyl's resistance to chemical attack stems from a low degree of unsaturation.

The new tires owe much to the development of butyl latex, which permits bonding of butyl rubber to tire cord on existing equipment.

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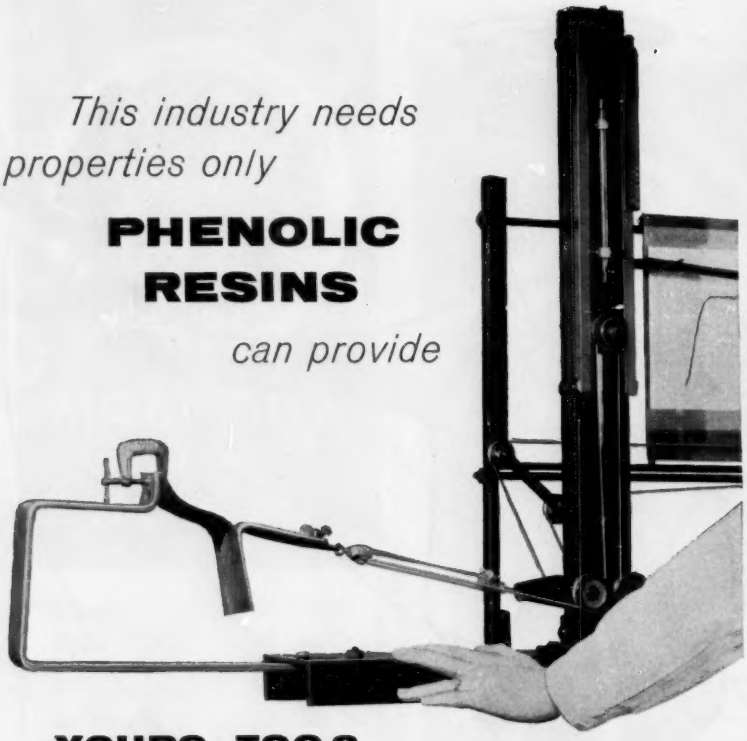

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RESEARCH

PROJECTS

• Battelle Memorial Institute (Columbus, O.) has started research on erosion-resistant materials for nozzles of a rapid-fire antiaircraft rocket. Under contract with the U.S. Army Ordnance Corps' Picatinny Arsenal, Battelle ceramic specialists are looking for a suitable low-cost, long-life, abundantly available lining.

• Horizons Incorporated (Cleveland) will try to improve the strength of clay sewer pipe, under a contract granted by National Clay Pipe Research Corp.

EXPANSION

• Enjay Co. (Standard Oil of New Jersey) has unveiled its new polymer laboratory at Linden, N.J., will stress butyl-rubber application research (*see p. 72*) in the 25,000-sq.-ft. facility.

• Standard Oil Co. of Indiana plans a two-year, $8-million expansion of its Whiting, Ind., research facilities.

• Arner Co., Buffalo (N.Y.) pharmaceutical firm, has opened a new laboratory equipped for analytical and microbiological research, physical testing, and production control.

• Reichhold Chemicals, Inc., will probe surface-coating resins and plastics at its new laboratory in Elizabeth, N.J.

• Construction has begun on Magnolia Petroleum Co.'s new field research laboratories at Duncanville near Dallas, Tex.

• Cook Electric Co. (Chicago) will reportedly devote one building of its planned 7-building, $3-million technological center to studies of the effect of nuclear radiation on fuels and lubricants. The radiation research will utilize cobalt-60, run 3 years under an Air Force contract.

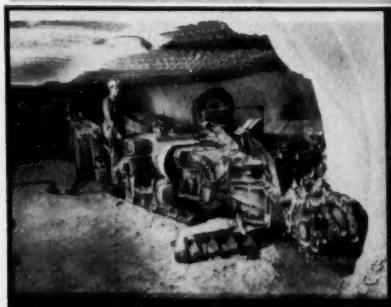
• Alco Products, Inc. (Schenectady, N.Y.), has formally opened its new lab for atomic-power development. Early studies relate to the reactor core for the Army package power reactor, a 2,000-kw. pressurized-water nuclear generating plant, which Alco is building at Fort Belvoir, Va.

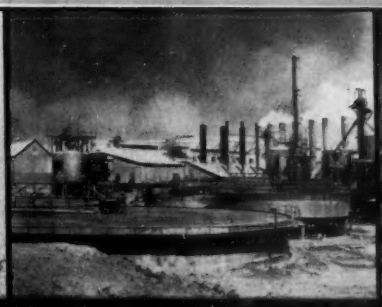
• Scott Paper Co. has purchased 41 acres at public auction from the city of Philadelphia for a main office and research lab to cost not less than $4 million. The wedge-shaped property cost $207,500, is located in Delaware County.

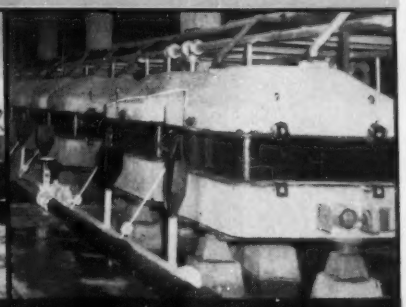
THERE'S ONLY 1 BASIC PRODUCER OF

caustic potash

INTERNATIONAL MINERALS & CHEMICAL CORPORATION







MINES
at Carlsbad
—the raw material
(sylvite ore)
KCl · NaCl

REFINES
at Carlsbad
—potassium chloride
KCl

MANUFACTURES
at Niagara Falls
—caustic potash
KOH

What's the advantage to you in buying from a basic producer? Greater security of supply. Consistently uniform quality. High purities. Prompt shipments on schedule.

International, alone among suppliers of Caustic Potash, is a *basic producer*, controlling production from ore bed to finished product. From sylvite ore mined at the 900 ft. level, the Carlsbad refinery produces electrolytic grade KCl. This 99.95+% pure material is shipped to the Niagara Falls plant for the manufacture of KOH and other potash salts.

CAUSTIC POTASH
CARBONATE OF POTASH
POTASSIUM CHLORIDE
SULFATE OF POTASH
HYDROFLUOSILICIC ACID
MAGNESIUM OXIDE
LIQUID CHLORINE
MURIATIC ACID

International MINERALS CHEMICALS

potash division

INTERNATIONAL MINERALS & CHEMICAL CORPORATION • GENERAL OFFICES: 20 NORTH WACKER DRIVE, CHICAGO 6
61 BROADWAY, NEW YORK 6 • MIDLAND, TEXAS • FULTON NATIONAL BANK BLDG., ATLANTA, GA.

SULPHUR

helps to create HEADLINE products

PAVING

FLOTATION OILS

INKS

VARNISHES

TALL-OIL

CLOTH

CUTTING OILS

RUST-PROOF COMPOUND

PAINT

SOAP

New uses are popping up everyday for this refugee from the skimmings of kraft mill black liquor. Tall Oil is fast becoming the antidote to a lot of supply shortage headaches and cost problems.

Tall Oil is extracted from black liquor skimmings with the aid of sulphuric acid. Some interesting experiments in connection with the refining of Tall Oil involve the use of sulphuric acid at subzero (centigrade) temperatures. Most applications of sulphuric acid are at room temperature or higher.

Here is a relatively new product, certainly a 'headline' product, and it requires a derivative of Sulphur in the reactions that make it!

Texas Gulf Sulphur Co.

75 East 45th Street, New York 17, N.Y.
811 Rusk Avenue, Houston 2, Texas

Sulphur Producing Units
- Newgulf, Texas
- Moss Bluff, Texas
- Spindletop, Texas
- Worland, Wyoming

Technology
Newsletter

CHEMICAL WEEK
October 6, 1956

Textile resin makers are taking a wait-and-see attitude toward Minnesota Mining & Mfg.'s new fluorocarbon that reportedly gives fabrics resistance to stains caused by both oily and watery substances. If the product—named Scotchgard—lives up to expectations, it could be tough competition for silicones, melamines, etc., currently used on apparel and upholstery. None of these resins stave off oil very well.

Auto makers have been particularly anxious to get an upholstery resin that permits easy, ring-free removal of oil-base cements and sealing compounds. These materials occasionally stain upholstery during auto assembly, can cause troublesome delay for upholstery replacement.

3M says Scotchgard has been evaluated favorably by "several of the largest mills in the textile industry," but won't discuss cost or the product's patent position. Main claims: the treatment makes textiles difficult to stain; but, if soiling occurs, solvent cleaners (e.g., carbon tetrachloride) will remove stains without leaving a ring.

The treatment can be applied either by padding or by an exhaustion process. In the first, the fabric is run into the solution in the padder trough and out through rollers that remove excess liquid (which runs back into the trough). The fabric (which may be wool or synthetic fiber or a blend) is then dried and cured at 220-300 F for 5-10 minutes. In the exhaustion process, the treatment is applied in the dye kettle. After the fabric absorbs the fluorochemical, it is removed and subjected to standard finishing operations.

•

Gas-phase chemical reactions carried out in a luminous high-frequency electrical discharge may soon offer a new route to compounds that are difficult or impossible to synthesize by conventional means. Lord Mfg. Co. (Erie, Pa.) has worked on the technique since 1944, says it is now "commercially feasible."

The process involves activation, formation and subsequent removal of products in zones of controlled pressure, temperature and residence time as the reactants flow through a radio-frequency field of decreasing intensity. The company's central research staff has applied the process to the production of anhydrous hydrazine from ammonia, states that yields were good enough to warrant future experimentation on pilot-plant scale.

Lord holds a patent (U.S. patent 2,684,329) on the process, but claims that techniques have been improved and new ones added since it was issued. The company has no immediate plan to commercialize its gas-phase synthesis; it is willing to license it—or cooperate on further research with an outside chemical development organization. Potential

applications: production of high-energy fuels for rockets and missiles; synthesis of intermediates for high-temperature-resistant polymers and other high-activation energy materials.

•

The National Science Foundation has taken the pulse of nonprofit research institutes and commercial laboratories and—in a newly published survey—finds them thriving. In 1953 (the survey year), these organizations did approximately $85 million worth of research, employed some 5,000 engineers and scientists.

The nonprofit institutes spent $50 million of this, $3 million of which went for basic research. Of the commercial labs' $35 million, about $4 million was spent for basic research.

•

Forecasts of a boom in chemical patents (*CW Technology Newsletter, Feb. 18*) are more than borne out by the record to date. Through Aug. 31, the U. S. Patent Office issued over 8,000 new patents. This amounts to almost a third more than the total issued all last year (6,065). The total in '56 should easily surpass the predicted 10,000.

•

The Canadian government has just cleared the use of American Cyanamid's Acronize process as a means of preserving fish. The process (*CW, March 24, p. 54*) employs tetracycline to halt growth of the bacteria that cause deterioration. In this country, it has been approved for poultry.

Now Canada permits the treatment to be used on fish immediately after they are caught. It is estimated that spoilage costs Canadian fishermen $25 million/year, and Cyanamid feels that Acronize can prevent a major portion of this loss.

•

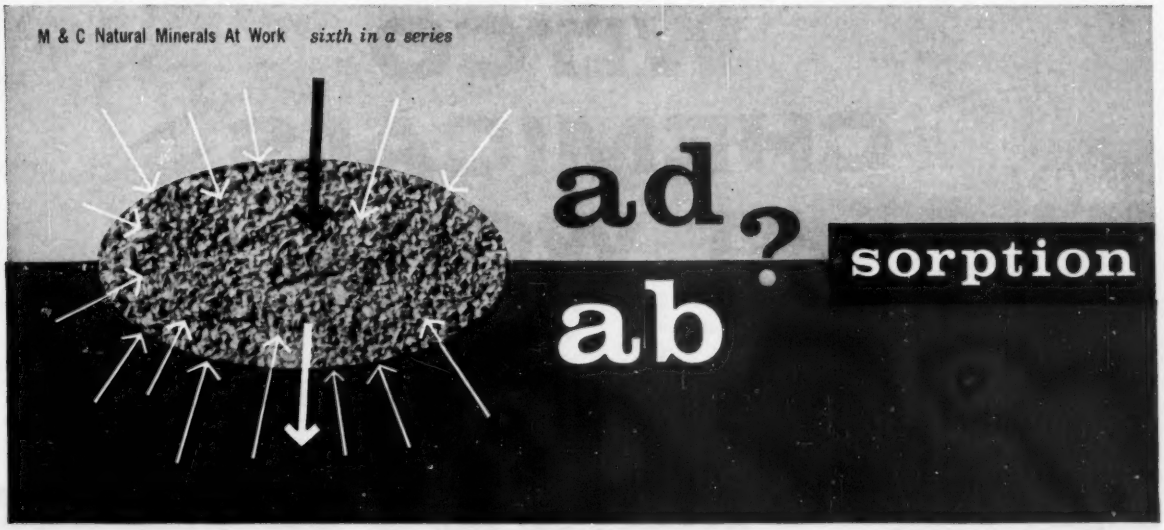
A newly formed Japanese firm will produce X-54 (American Cyanamid's Creslan, acrylic fiber) and will market it as Exlan. Sumitomo Chemical and Toyo Spinning have teamed up, will build a $1.1-million pilot plant at Iwakuni in southwest Japan. The plant will turn out 1 ton of fiber per day. A second, larger plant ($3.3 million) to make 5 tons/day will be put up later. Cyanamid will supply technical assistance.

•

New forms of erythromycin as well as a better understanding of its metabolism and physiological action should result from Eli Lilly and Co.'s successful investigation of the antibiotic's structure. After four years of work, a team of seven organic chemists have just put the finishing touches on the structural proof.

The compound was found to consist of a large lactone ring (erythronolide) to which are attached two unusual sugars (desosamine and cladinose). This gives it a completely saturated structure with 19 asymmetric carbon atoms, 11 of which are in the erythronolide ring.

M & C Natural Minerals At Work *sixth in a series*



You choose the prefix . . . we'll supply the medium

In The Field Of Sorption Processing, did you ever debate *ad* versus *ab*? Aspects of pore structure, liquid-solid interface, solute, sorbate, etc., can lead a merry chase. But whichever the prefix, there's usually an M & C sorptive mineral that's ideal for the job to be done.

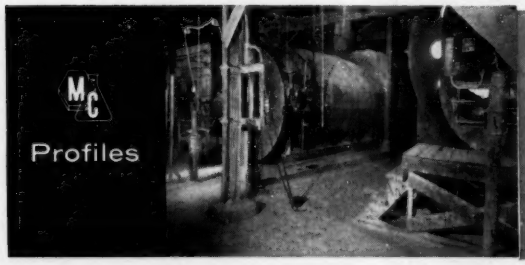
Want To Take Molecules Out? M & C offers grades to decolorize, refine, purify. You can use them to remove odors, colors, taste, moisture, acids, sulfur compounds, fluorides, unsaturates, and a host of other molecules you may be interested in.

Or Put Them In? Other M & C naturally-sorptive minerals serve as carriers in a wide variety of processes.

Want Anti-Caking Protection? This, too, is a job for M & C's low-cost sorptive materials. For example, in most cases less than 1% will condition even the most sticky, waxy or hygroscopic chemicals.

Collecting Undesirable Water? M & C reliable desiccants dry air, hydrogen, CO_2, hydrocarbons, other process fluids and gases.

Let's Team Up. We'll soon arrive at the right balance of efficiency, purity, treating conditions and economy, and your problem will be well in hand. Use the coupon.



Automatic controls and modern instrumentation in this bank of M & C rotary kilns insure tight process control over the many grades of sorptive minerals . . . more reasons to

Think of M&C as:

- Important miners and processors of non-metallic minerals
- Leaders in related research and development
- Marketers-Through-Service of a wide line of mineral products to meet industry's needs.

MINERALS & CHEMICALS CORPORATION OF AMERICA
46 ESSEX TURNPIKE
MENLO PARK, NEW JERSEY

M&C's trade-marked products include:
Adsorbents • Aluminum Silicate Pigments • Attapulgite
Activated Bauxite • Catalysts • Fluxstone • Kaolin • Lime Chemicals
Limestone Aggregates • Speedi-Dri Floor Absorbents

MINERALS & CHEMICALS CORPORATION OF AMERICA
46 Essex Turnpike, Menlo Park, N. J.

Please send me:

☐ 16-page bulletin that tells the full M & C story
☐ Samples, information on M & C sorptive products for use in

_____

_____

name_____ title_____

company_____

address_____

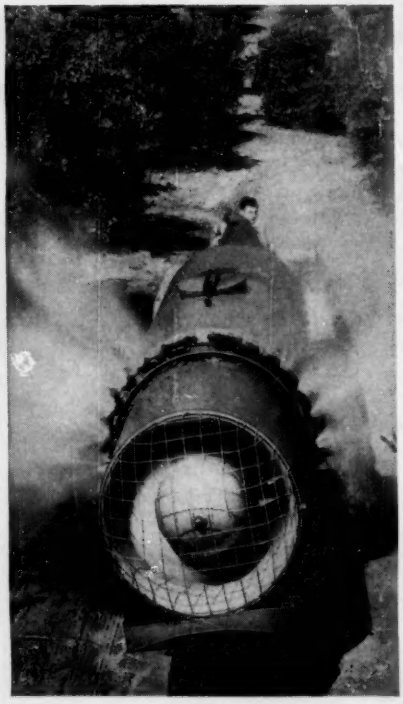
city_____ zone_____ state_____

WITCO CHEMICALS AT WORK

Bigger crops...tougher tires...clearer vinyls...

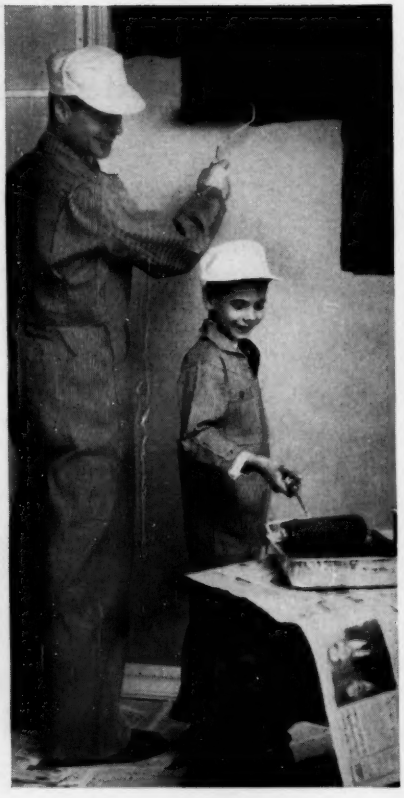
LOOSENING IMBEDDED GRIME

—a quick and efficient operation with Ultra's Neopone LO, a low-foaming detergent especially designed for tumbler or agitator type automatic washers. Ultra Chemical supplies a complete line of detergent liquids, flakes and beads from one source. *Ultra Chemical Works, Inc., Paterson, N. J.*



CROP YIELDS ARE CONSTANTLY EXPANDING

through better protection against insects and weeds...a result of increased efficiency in pesticide sprays formulated with EMULSOL emulsifiers. *Emulsol Chemical Corporation, Chicago, Ill.*



WHAT A DIFFERENCE SOME PAINT MAKES.

Improved suspension of pigments in paints is one of the many applications of WITCO Stearates. These metallic soaps have many properties which make them exceedingly useful in a wide variety of industries. They impart flatness to varnish and lacquer films, internal lubrication of plastic masses, heat and light stabilization of vinyl compositions, and impart water repellency to fabrics, concrete, bricks, etc.

through Witco's accent on quality and service

INCREASED TEAR AND ABRASION RESISTANCE

in many of today's top-quality automobile tires is achieved through the use of specially developed WITCO-CONTINENTAL reinforcing carbon blacks. *Continental Carbon Company, New York, N. Y.*

COME RAIN OR SHINE.

Vinyls formulated with WITCO STAYRITES® keep their color when exposed to heat or light over extended periods. Witco produces a variety of STAYRITES for the proper stabilization of Vinyl resins.

Witco chemicals are busy at work in many fields... helping to improve products, increase processing efficiency and provide solutions to production problems.

Behind Witco's service in industry are 36 years of steady growth... a story of constantly expanding research and production facilities.

Witco produces a large number of *quality* chemicals for many industries.

For additional information on these or other Witco products, write today.

36 Years of Growth

WITCO

Associated Companies:

ULTRA Chemical WORKS

CONTINENTAL CARBON

Emulsol

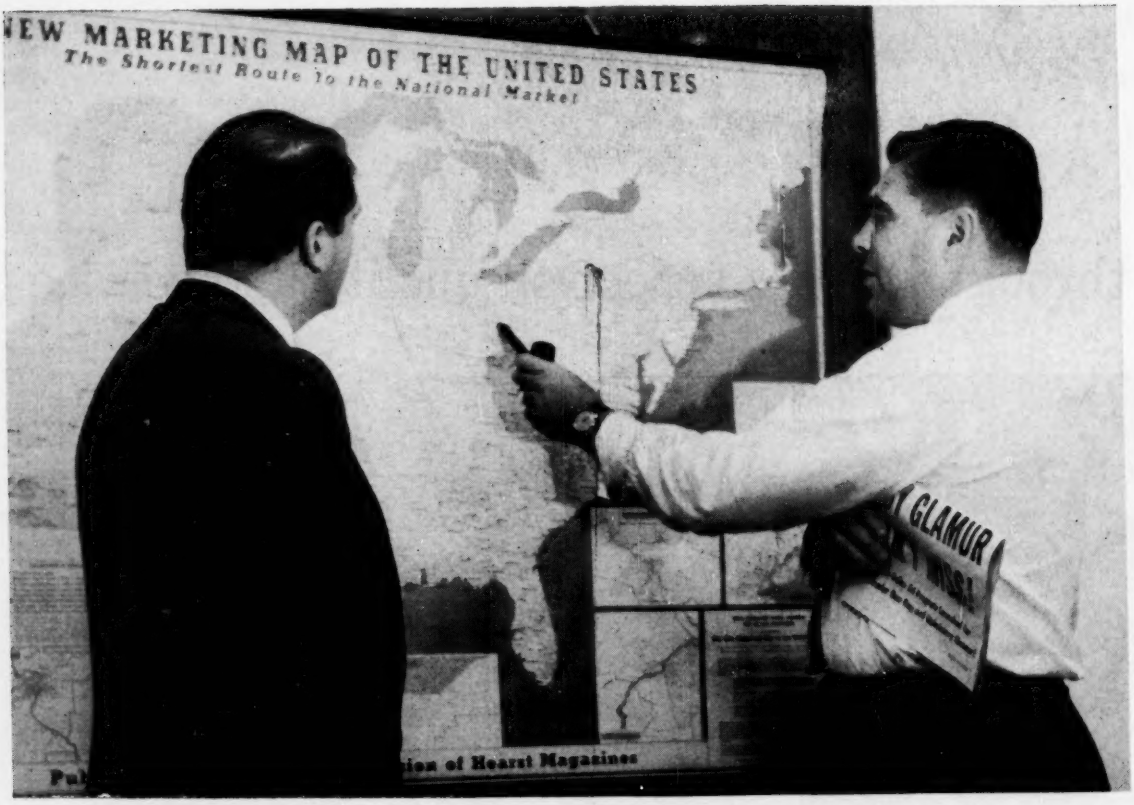
Industrial Quality PRODUCTS

WITCO CHEMICAL COMPANY

122 EAST 42ND STREET, NEW YORK 17, N. Y.

Chicago • Akron • Boston • Atlanta • Houston • Los Angeles • San Francisco • London and Manchester, England

14 Manufacturing Plants — 5 Research and Service Laboratories



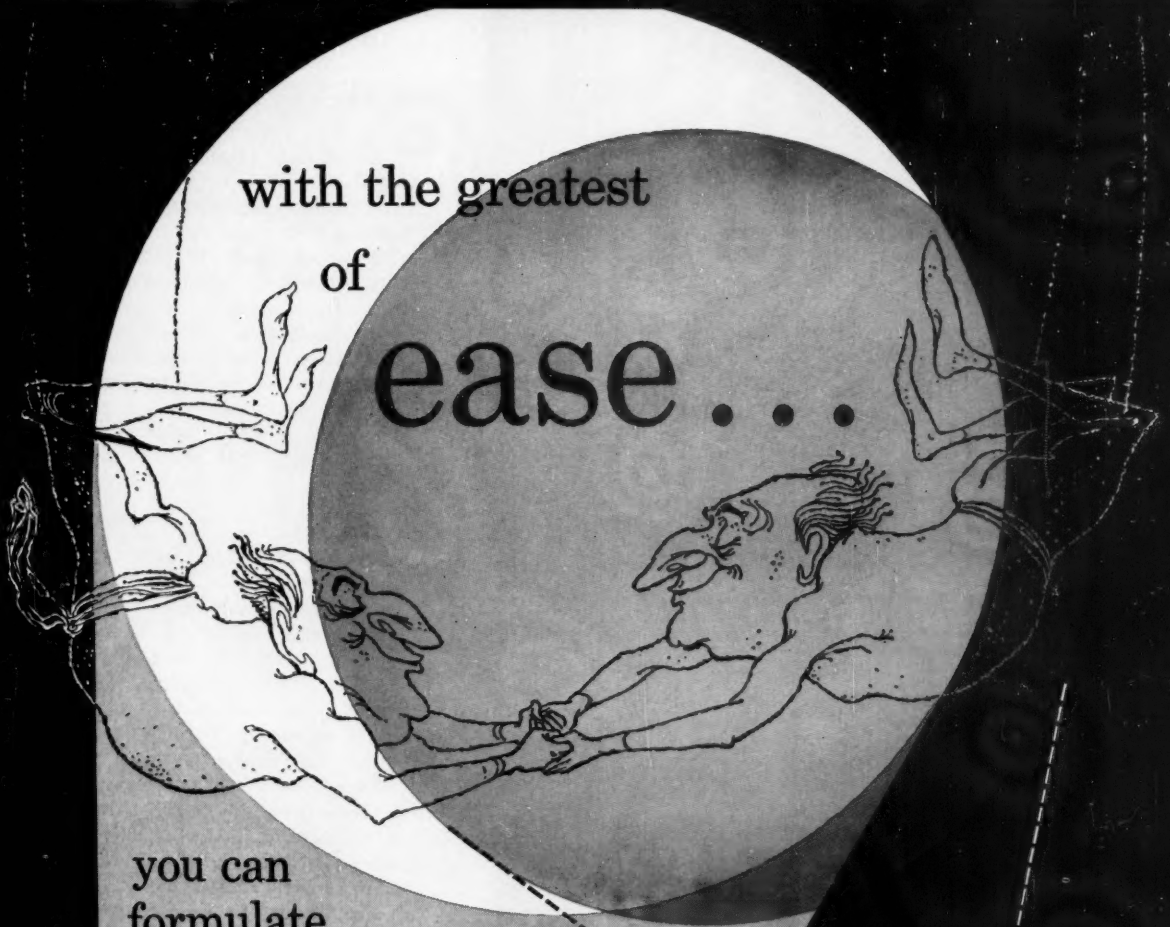
THE BIG MARKET: A small specialties maker going national finds way eased by sales agents who lend . . .

A Helping Hand for the Nationwide Step

Despite the many hazards of going into national distribution, more and more specialties makers are taking the plunge. Not only are profit opportunities unusually high right now, but there's plenty of expert assistance available to improve the risk-to-profit ratio. One of the most important—and oldest—of these marketing aids is the manufacturer's respresentative or sales agent.

Today the manufacturer's representative is likely to be a well-staffed organization of merchandising and promotion people offering a comprehensive program for expanding distribution. Such firms out to do a job will often demand a substantial voice in the manufacturing firm's advertising,

SELL SALESMEN: Sales agent Alpert instructs, advises staff.



with the greatest of

ease...

you can formulate compositions with

PICCOLASTIC

24 standard grades—polymers of styrene and its homologues

SYNTHETIC RESINS

Made in five series and twenty-four standard grades, Piccolastic Resins are pale in color, soluble in aromatic hydrocarbons, alkali and acid resistant to a high degree, do not support mold or other fungus growth, and are not subject to enzyme reaction.

Being permanently thermoplastic, they make excellent stable, hot melt compounds.

Piccolastic Resins vary from viscous liquids through tacky solids, brittle solids to resins of hard horny toughness.

PENNSYLVANIA INDUSTRIAL CHEMICAL CORPORATION — PICCO

Pennsylvania Industrial Chemical Corp.

Clairton, Pennsylvania

Plants at:
Clairton, Pa., West Elizabeth, Pa., and Chester, Pa.

District Sales Offices
Boston, New York, Detroit, Chicago, Cincinnati
Los Angeles, Philadelphia, Pittsburgh

Pennsylvania Industrial Chemical Corp. (CW)
Clairton, Pennsylvania

Please send bulletin and samples of Piccolastic Resins for (application)_____

Name_____

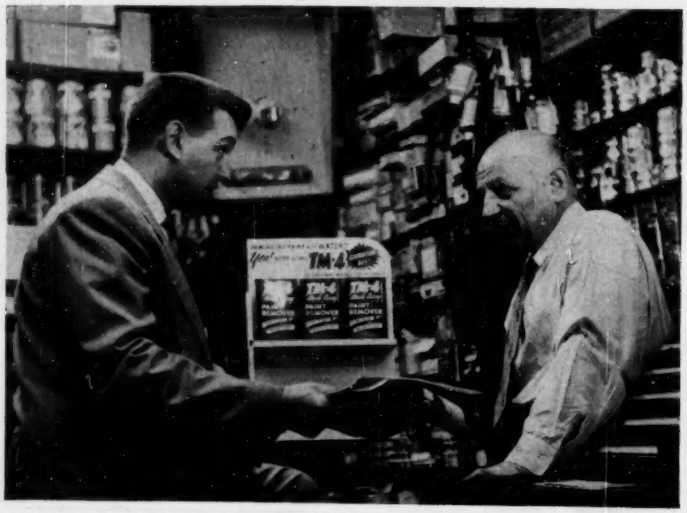
Position_____

Company_____

Address_____

SELL CONSUMER: Sales program includes radio spot commercials.

SELL CLIENT: He must be convinced new display is worth money.



SELL DEALER: Agent's main job is to keep retailers ordering.

packaging and pricing policies.

What are these manufacturer's representatives like, what's involved in dealing with them? A composite picture would not be very meaningful, since they differ considerably in details of operation. But the underlying principle, in most cases, is the same, may be highlighted by the workings of one member of the group. Take, for instance, the case of George Alpert, Inc. (New York), a firm that recently produced a 10-fold boost in sales of two products: a paint remover and an upholstery cleaner.

Old Story, New Story: Manufacturer's agents are primarily a sales arm. Generally, they specialize as to type of product—almost every kind of line has been staked out by one or more of them (the "yellow pages" classified telephone directory in New York City lists about 1,000). Although not all of the agents offer the same service, those most important to chemical specialties makers concern themselves mainly with interesting retailers in the specific product, and getting their orders. The agent does not (for the most part) do any shipping, billing or maintaining of stocks of the products. It's up to others (jobbers for example) to see that goods ordered are received by the dealers.

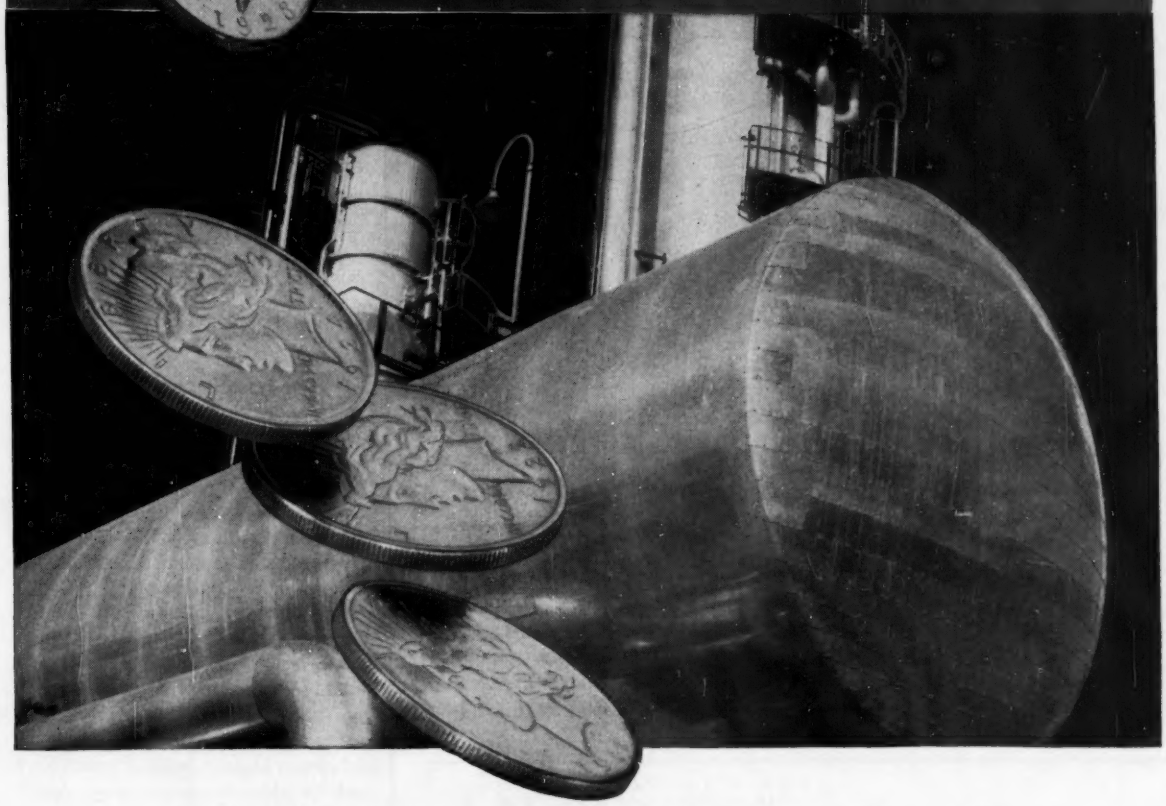
Although some use their own techniques in getting stores interested (such as the use of demonstrators), most agents pretty much follow the lead of the firms they serve. They use the advertisements and general approach (package, pricing, etc.) of the manufacturer.

For this selling service, agents are paid a percentage of gross sales in the area assigned to them. These fees vary within the range of 5-10%, with payment on a month-to-month basis.

Top to Bottom: A firm like Alpert, on the other hand, while retaining such traditional features as no-shipping, no-billing, no-stocking, seeks a direct say on virtually every angle that affects selling. Its top-to-bottom approach* means that it is interested in the product's package design, its display, its price, its advertising. Where

*Such broad-gauge approach to merchandising is true of several types of organizations—more than one advertising agency has merchandising specialists either on its staff or with whom it works on a more or less regular basis.

Aluminum Jacketed Process Plants...



...Stay Bright as the Dollars You Save

Aluminum resists rust and corrosion due to chemicals, gases, plant atmospheres, coastal environments. You enjoy the natural "bright-as-a-dollar" appearance of this long-lasting metal. You save the expense of painting. You save many dollars on replacement of equipment often destroyed by rust and corrosion.

You benefit in other ways, too, with aluminum. It's non-sparking. Eliminates much of the danger of costly fires and explosions. Makes it ideal for walk-ways and tank decks.

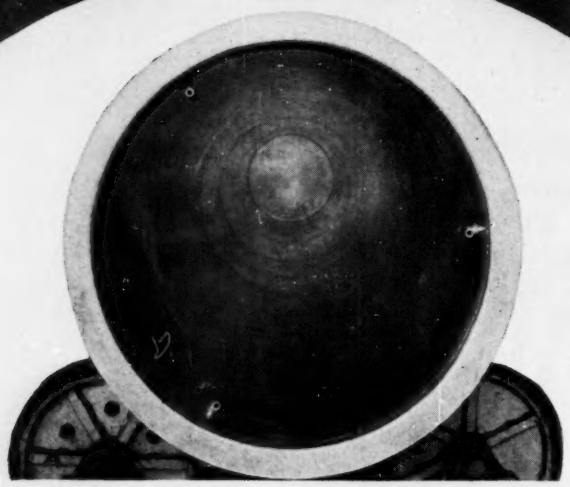
Aluminum is versatile. You get natural insulation and high heat transfer from aluminum in many plant uses. Use it for heat exchangers, high pressure steam lines, fractioning towers and many other applications.

Wherever you use aluminum, it remains bright, lasts long, and saves you money. To get more information on aluminum in the process industries, call the Reynolds office listed under "Aluminum" in your classified telephone directory. Or write *Reynolds Metals Company, P.O. Box 1800-CM, Louisville 1, Kentucky.*

The Finest Products Made with Aluminum are made with REYNOLDS ALUMINUM

Watch for Reynolds New Program, "Circus Boy", Sundays on NBC-TV

this is
HORTONCLAD

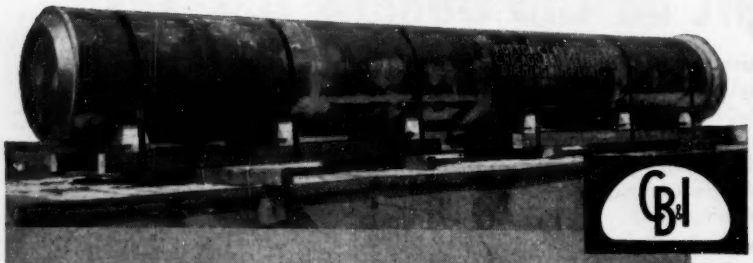


You are looking into the interior of a 37¼-in. O.D. by 24-ft. 10-5/7-in. autoclave liner with *fine silver* Hortonclad® on stainless steel backing.

Hortonclad, available only with CB&I process and storage vessels, is a composite metal having an integral and continuous bond produced by a high vacuum brazing process. CB&I vessels can be fabricated using Hortonclad plates with silver, monel, Inconel, Hastelloy, stainless and other metals and alloys.

Write our nearest office for further information on Hortonclad and its use with CB&I vessels.

Below: 37¼-in. O.D. by 24-ft. 10-5/7-in. autoclave liner fabricated of Hortonclad plates, ready for shipment from our Birmingham plant.



CB&I

Chicago Bridge & Iron Company

Atlanta • Birmingham • Boston • Chicago • Cleveland • Detroit • Houston
New York • Philadelphia • Pittsburgh • Salt Lake City • San Francisco
Seattle • South Pasadena • Tulsa
Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY and GREENVILLE, PA.

it feels outside agencies can help (with advertising, for example), it suggests them, and works with them closely.

Rule of Four: In the dozen years that it has offered its wide-gauge program of representation, Alpert has formulated some definite rules on sales methods and product types. Here's a sampling:

- An ounce of cure is worth a pound of prevention, so far as selling specialties goes. The tarnish remover sells far more easily than the preventer because it is more easily adapted to promotion ideas.
- "Missionary" sales contacts are indispensable. The contact man calls on dealers in person and often, keeps his products high in the minds of his customers. With Alpert, biweekly meetings of the missionaries for particular products are held so that new ideas, problems and such can be brought out for discussion.
- Don't underprice your product. Substantial price tags on new specialties, Alpert has learned, don't cut sales, and definitely do help to pay for extensive promotion, insure profits.
- Daytime radio spots sell both dealers and customers. The consumers are introduced to the products, and the dealers have convincing proof that there's a strong ad program behind the item they're being induced to sell.

Alpert puts its own suggestions to good use, offers as proof of their value the success stories of two products—one a paint remover, the other an upholstery cleaner, both of which have had 10-fold sales jumps since Alpert has handled them.

Money Takes Money: With the conventional type of representative, a firm risks little, since the representative gets paid on his sales. With Alpert, however, charges for extra services such as ad programs, package design and the like become a part of plant overhead not tagged to sales. In addition, Alpert (like conventional firms) usually gets paid a percentage of sales, sometimes takes a stock interest in the represented firm.

Alpert, figuring each case is an individual matter, is reluctant to toss out any maximum or minimum costs for its service. But a $2,000-3,000 investment, it says, will get many programs started, and a straight merchandising aid program is offered for $100/day.

Merchandisers, Not Producers: This

Will she turn up her nose at your product? Or will she buy?

Santomask II: Better Smell for Faster Sell

Trend: like eye-appealing color and packaging, improved product odor gives sales another "jet assist."

Imaginative manufacturers are cashing in on the tendency of the American consumer to "follow his nose." Today, it's a costly mistake to take bad smells in a product for granted, particularly when a high-potency odor-improver like Santomask* II is available at such low cost. Just a small amount in the formulation is the secret of better-smelling paints, rubber goods, vinyl films, even fuel oil and turpentine!

Santomask II has an airy, fresh smell faintly resembling fresh-baked layer cake. While the amount needed varies from product to product, it generally takes only a bit to do away with the unpleasant smell of other ingredients.

Example: Vinyl films and coatings often give off the smell of the plasticizer. A pound of Santomask II per 100 gallons of plasticizer mix or a pound per 1,000 pounds of solids usually is enough to counteract this odor. Result: better-smelling shower curtains, baby pants, upholstery, slush-molded toys, or similar vinyl or rubber products.

Today, smart paint makers of water-base, oil-base, and alkyd solvent release paints add a tiny amount of Santomask II because commercial painters as well as "do-it-yourself" painters favor the better-smelling products—and sales show it. Odor-free turpentine and paint thinners are also appearing.

Santomask II soon may open the way to greater use of household insecticides and create distinct brand-preference for automobile polishes. Women buy and use a surprising amount of these two items . . . and improved smell can certainly sway the ladies. A few other products that can easily gain sales appeal with Santomask II: shoe polish, inks, adhesives, and paper.

A strong point favoring the use of Santomask II: high potency at small cost. Actual amounts used vary because obnoxious odors vary in strength. However, with Santomask II, a good rule-of-thumb for estimating odor *improvement* costs is to start with a concentration of about 0.1%. Concentrations simply for odor *masking*, will run about half that, as in the case of kerosene; about double for turpentine or some synthetic rubbers. Masking costs range from 40¢ to $1.60 per 1,000 pounds. A big bargain—especially when you consider the extra sales you can build with an "odor-free" product.

For more complete information on Santomask II or Sopanox* (described below), write today. For laboratory-size samples, just send your request on your company letterhead. Write to: Organic Chemicals Division, MONSANTO CHEMICAL COMPANY, Dept. CS-3, St. Louis 1, Mo.

Reg. U. S. Pat. Off.

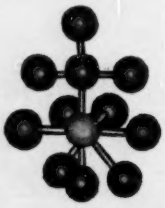
Soap Report: Rancidity Insurance

The housewife doesn't care two whoops about chemistry. If she lays a bar of soap on a sunny window sill and it darkens and starts to "smell"—she blames the soap. If she leaves a box of granules or chips in a steaming hot closet, she blames rancidity on the soapmaker. Even industrial buyers of soap powders expect the finely divided product to stay fresh, free-flowing, sweet-smelling forever under all storage conditions.

Smart soapers are insuring brand loyalty by adding small amounts of ortho-Tolyl Biguanide (Monsanto trade name: Sopanox). Extremely small amounts are effective as an antioxidant to prevent rancidity and discoloration. Its presence has no effect on color, odor, lathering, or ability to cleanse.

Looks bright, smells right: soap protected from rancidity and discoloration by Sopanox.

Added during milling or crutching, 0.04-0.05% Sopanox is sufficient for high titer and low iodine number soaps; 0.10% for low titer, highly unsaturated soaps. One major soaper uses it regularly in a top-notch quality tallow-coco oil soap to insure its whiteness.



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Espesol aromatic and aliphatic solvents are produced under such exact conditions that you can always expect them to be of exceptional uniformity, the highest quality and finest purity.

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outlay for agressive merchandising, Alpert feels, is just as vital as the outlay for development or production equipment. Many of the new materials for specialties—silicones, new resins, new solvents and the like—have been developed by firms that are more technically minded than merchandising minded. To these firms, representatives such as Alpert sell merchandising acumen.

Whether a firm should go to outsiders for such aid as this is an individual matter, of course. Many prefer not to share vital business decisions. But the big decision, whether or not to expand and take the risks it involves, will always be up to the individual company alone.

Liquidation Order

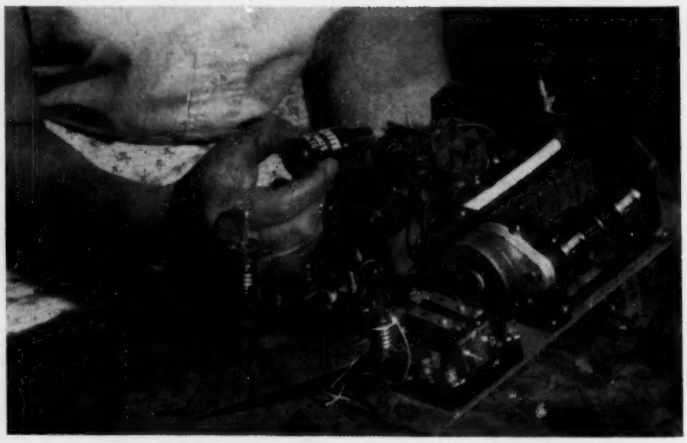
To counter its bug problem, the Communist Chinese government has placed a $350,000 insecticide order with the Union of South Africa. Red China's London agents placed the order, which had been sought by chemical companies throughout the Western world.

The contract calls for benzene hexachloride, which will be produced by the government plant at Klipfontein, Transvaal. China will be the twenty-first country to obtain benzene hexachloride from Klipfontein.

More Togetherness

Making its debut is a new bonding agent for bricks, concrete, cement, cinder block, tile and other masonry materials. It's Permagile, of Permagile Corp. of America (Long Island City, N.Y.), an epoxy-base resin. Having undergone tests and limited use in the East, the product is now being placed on the national market.

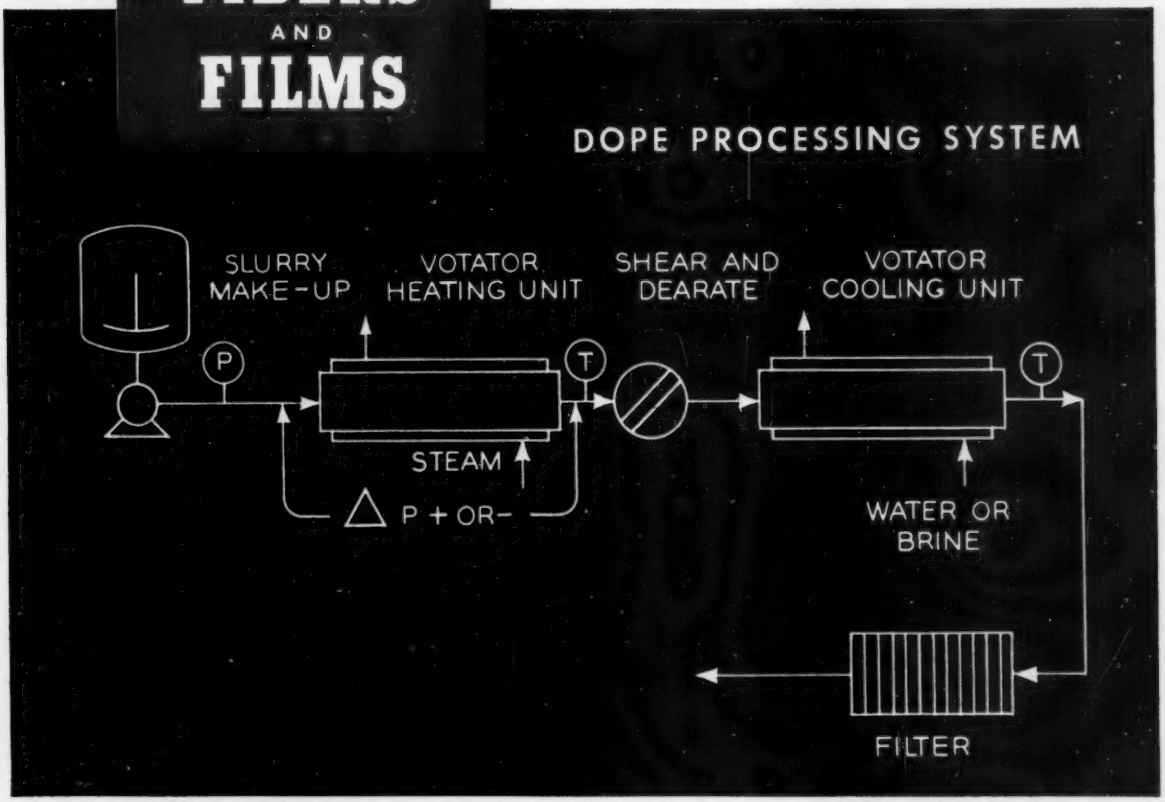
Said by the maker to be the only product in existence capable of permanently repairing severe spallage and



Squeeze-Bottle Screw Sealer

THE CLEAR THIN liquid resin being squeezed onto the screw threads in the magnetic switch (*above*) will prevent vibration from loosening the assembly. That's the claim of American Sealants, Inc. (Hartford, Conn.), which makes the product; it was invented by a retired professor (Trinity College, Hartford), Vernon Krieble, who has an interest in the company. The product is said to set quickly and hold securely, but allows parts to be deliberately separated without the aid of special equipment or solvents. Cost $2/10 cc. American Sealants says Loctite is being used in the manufacture of pumps, magnetic switches, electric shavers, sees a big future in electronic equipment.

FIBERS AND FILMS



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- **Greater efficiency reduces utility cost.**
- **On many applications ceramic and other inert materials have been used in mechanical seals with good results and are always available.**
- **Long service life and minimum maintenance due to the new unique shaft design which practically eliminates wear.**
- **Equipment may be obtained in corrosion resistant materials of construction.**

Applications include polyacrylonitrile and acrylic copolymers, viscose (rayon and cellophane), cellulose acetate, cellulose ethers and polyesters.

The experienced engineers and laboratory facilities of Girdler are at your disposal to help apply this improved processing equipment to *your* problems. Write for copy of Bulletin V248.

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cracks in concrete, Permagile is also claimed to be:

- Unaffected by aging or atmospheric conditions.
- Unharmed by alkalis, most acids.
- Unaffected by temperatures between —20 and 270 F.
- 30-40 times as elastic as normal concrete.

Also reported: a compression strength of 35,000 psi., resistance to water pressure up to 30 psi., hardness of 36 Barcol, water absorption of 0.12-0.13%.

Applications thus far have been in the restoration of concrete buildings, grain elevators, and tanks.

Ball-Point Painter

Latest application of the ball-point principle in specialties packaging is a new paint dispenser. Designed primarily for home craftsmen not crafty enough to get desired results with a paint brush, the new container should also find applications in marking and coding.

The applicator consists of a 1-oz. metal tube of paint with a removable (for cleaning) ball point on one end. Developed and sold by Binney and Smith, Inc. (New York), the device uses paints based on Goodyear's Pliolite S-5.

One of the product's big appeals to do-it-yourselfers: it can be used to paint designs on fabrics, wood, glass, pottery, plastic, tile or metal—without the use of stencils or masks.

Called Amazart, the tool is available singly or in sets of four colors (choice of 12 colors) for 75¢/tube.

Cure for Sick Chicks

U.S. Dept. of Agriculture is finding a combination chemical treatment to be highly effective in the treatment of cecal coccidiosis, a killing disease of baby chicks. The treatment involves use of sulfamethazine with Aureomycin.

Experiments show that affected chicks getting the two drugs in their diet actually make faster gains than healthy ones fed similar but unmedicated rations. Sulfamethazine alone satisfactorily controls the disease; Aureomycin promotes greater-than-average growth gains.

To be effective, the treatment must begin as soon as chicks are exposed to infection. Symptoms of the disease do not show up until four days after infection—and death usually occurs on the fifth.

Wipe that Repels

With a new treated tissue, a wipe of the brow wipes off perspiration and applies an insect repellent at the same time. The product, called Repellen-Tissue, is made by Whitmire Research Laboratories, Inc. (St. Louis), distributed by Mine Safety Appliances Co. (Pittsburgh).

Resembling facial tissues, the brow-wipers are treated with five basic insect repellents, are said to be neither irritating nor greasy to use. Anticipated big market: among road crews, linemen, telephone repairmen, and other outdoor workers.

Each tissue can be used a number of times. They are packaged in plastic pouches containing 10 tissues each.

EXPANSION

Finish Line: Nicromatic Ltd., a newly formed Canadian company, has established plant and office facilities at Mimico, Ont. The one-story building has a floor area of 6,000 sq. ft. The company will manufacture buffing compounds, cleaners and general plating supplies for the metal finishing and plating industries.

•

Cash and Carry: Childsco Products Co. (Aiken, S.C.) has been sold to James R. and Mary S. Driggers, who plan to take the firm home with them to Lake City, S.C. The deal includes all formulas and the Childsco trademark. At the new location, production of five of the firm's polishing, cleaning and waxing compounds, currently distributed through all Southern states, will be resumed by November.

•

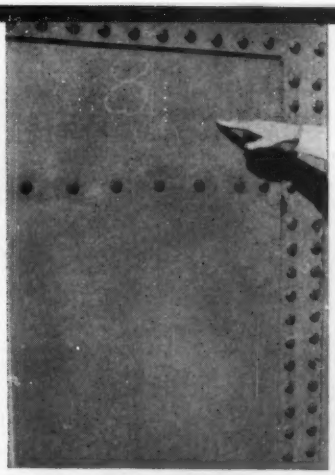
Latex Stretch: A 16,000-sq.-ft. plant will be built in Brampton, Ont., by General Latex and Chemicals (Canada) Ltd. The company already has a plant in Montreal, needs the new facility to supply the growing Ontario market for natural and synthetic rubber latex, compounded latex adhesives, and plastisols.

•

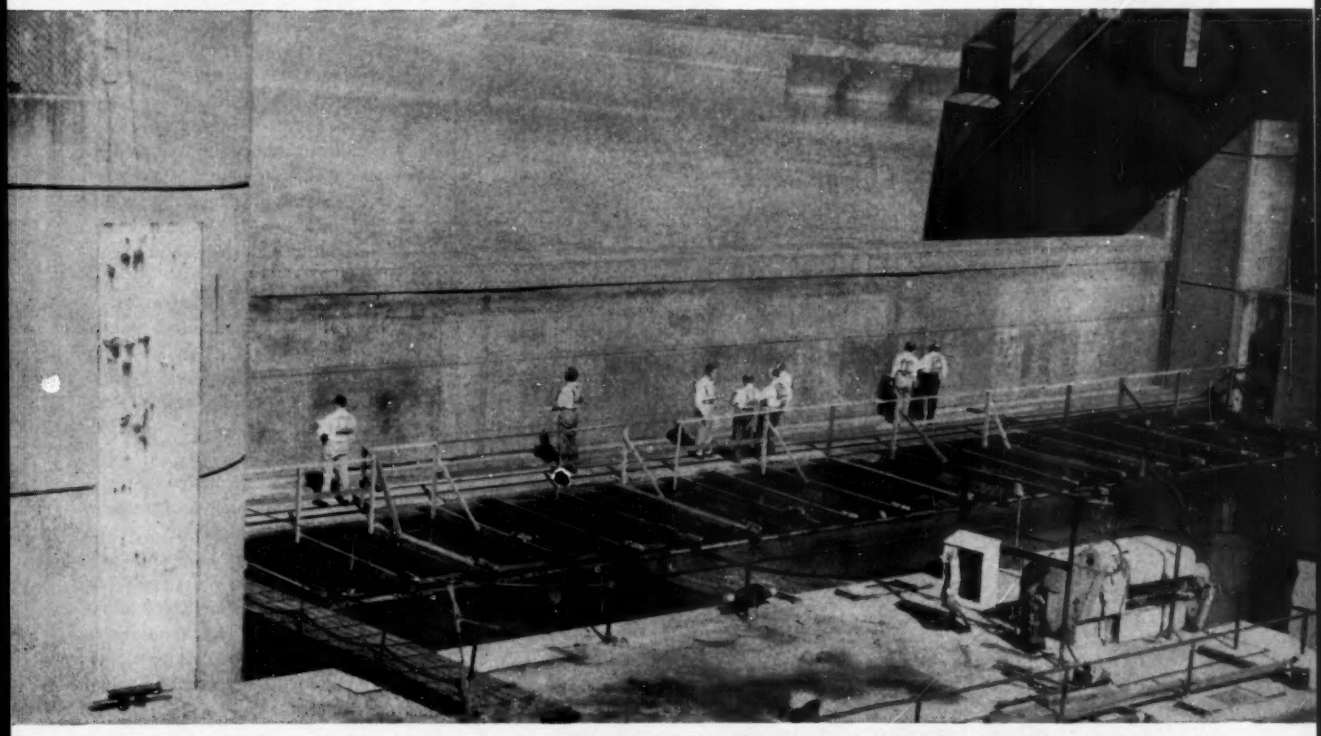
Crude for Shoes: In Treysa (Hessen), Germany, Farbwerke Hoechst AG. (Frankfurt) will build a new plant

Vinyl resin based coating for steel work

Best in 5-year test!



Close-up of steel test panel shows freedom from corrosion. Coatings used in this test formulated by **Thompson and Company,** Oakmont, Pa.



This outstanding record was made of coatings based on BAKELITE Brand Vinyl Resins. Applied to the upstream side of the lift gate after old paint and rust were removed, a coat of special wash primer was used followed by three coats of aluminum-pigmented Vinyl paint.

To test coatings under actual operating conditions, twenty-five systems were applied to a steel-plate lift gate of the Emsworth Dam on the Ohio River near Pittsburgh. Five years later, 17 impartial and competent observers for industry and Corps of Engineers, U. S. Army, judged a Vinyl Resin based coating best... after nearly constant submersion in river water!

Here is another example of the fine service you can expect with coatings based on BAKELITE Brand Vinyl Resins... for buildings or structures, interior, exterior... for any type of surface... for resistance to acids, alkalies, salt spray, corrosive atmospheres, wear or abrasion.

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SPECIALTIES

for the production of crude mining wax. Construction has started on the DM-4-million ($1-million) plant, and it is expected to be in production in the spring of '57. Crude mining wax is the initial product for a number of technical waxes suitable for lubricants, shoe polish, carbon paper and other products.

•

Packing House: A 33,000-sq.-ft. plant now being constructed for Chemical By-Products Ltd. (Toronto) will be outfitted with the latest in processing and packaging equipment, including complete facilities for filling and sealing polyethylene tubes and bottles, for the company's custom-packaging division. Future plans call for the construction of a separate plant at the same location for extrusion and manufacture of polyethylene containers. The company, a completely owned subsidiary of Sugar-Beet Products Co. (Saginaw, Mich), will continue to manufacture the parent organization's line of waterless and powdered industrial soaps and cleaners.

•

North and South: Minnesota Paints, Inc. (Minneapolis), will make a big bid for the booming Southwest market when it completes its new 42,000-sq.-ft. plant at Dallas, Tex., this December.

•

Pet Project: Samuel Lichtenstein, chairman of the board of District Wholesale Drug Co. (Washington, D.C.), has purchased Pet Chemicals, Inc. (Miami). Lichtenstein plans to expand production of the company's line of flea and tick powders and dips, and to increase the number of dealers and distributors.

•

Big Horn: A. C. Horn Co. of Texas (Houston), maker of paint, concrete floor hardener, and other industrial maintenance products, will consolidate its plant, warehouse and office into a new building now going up. The firm is a subsidiary of Sun Chemical Corp.

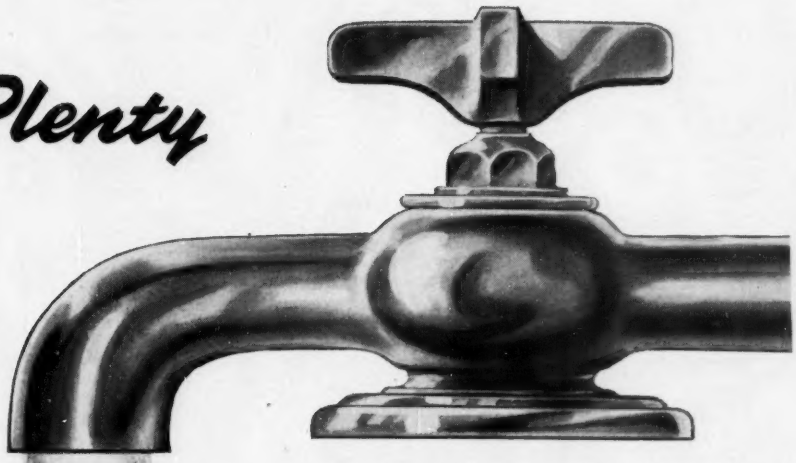
•

Contraction: Wilson & Co. (Chicago) is going out of the soapmaking business. The firm will close the Camden, N.J., plant of its wholly owned subsidiary, J. Evenson and Sons, as soon as present supplies of raw materials are exhausted. The high cost of

in the

Land of Plenty

there's plenty of water for industrial use...



If an adequate water supply is an important consideration in the selection of your new plant site, as it is for most industrial site-seekers, then it will pay you to investigate the Land of Plenty where the annual rainfall is about 30 per cent above the national average.

It's a U. S. Weather Bureau fact that the annual rainfall of the 48 states as a group averages 31-36 inches, while that of the six states served by the Norfolk and Western is 40-45 inches. And not one of the states is below the national average.

In this land of many rivers, adequate water is but one of many natural and man-made advantages for industry. Detailed factual information about these advantages will be gladly furnished by our plant location specialists, in confidence and without obligation.

Land of Plenty rivers:

James River	Pigg River	Guest River
Appomattox River	Smith River	Bluestone River
Nansemond River	Mayo River	Big Sandy River
Elizabeth River	Potomac River	Ohio River
Black Water River	Shenandoah River	Little Miami River
Roanoke River	Holston River	Scioto River
Dan River	Clinch River	
Bannister River	New River	

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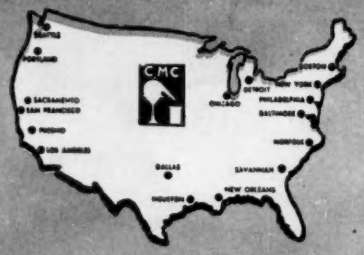

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SPECIALTIES

operating the obsolete plant—built in 1902—is the stated reason.

•

Spanish Color: Sherwin-Williams paints will be made by two new overseas licensees—in Colombia and in Spain. Sherwin-Williams de Colombia, S.A., will this fall complete a $500,000 installation at Fontibon, which, at full production, will employ 100 Colombians.

A hundred Spaniards will be employed by the newly formed Sherwin-Williams Espanola, S.A., at its new $1-million plant at Barcelona—which the company calls "the most modern paint plant in the world." It expects to produce 900,000 gal, of paint the first year.

•

Splintered. Agriform Co., Inc. (Bakersfield, Calif.), will be liquidated and succeeded by four new and separate independent corporations. Each will buy a part of the physical assets of the liquidated company, each will retain the Agriform name (Agriform Co. of Imperial Valley, Inc., etc.). Agriform, before the split, claimed to be the largest independent liquid fertilizer manufacturer in California.

•

Old Spice: Shulton Inc., manufacturers of toiletries (including the Old Spice line), fine chemicals and pharmaceuticals, has opened its first Canadian manufacturing plant at Don Mills, Ont. The 32,000-sq.-ft. plant will be headquarters for all the firm's Canadian activities.

PRODUCTS

Antifoamers: Hodag Chemical Corp. (Chicago) is introducing a specialized formulation designed to decrease excessive foaming often encountered in operation of continuous diffusers. Based on fractionated edible vegetable oils, Hodag BX-108 will be used in processing the '56 sugar beet crop.

•

Copper Fluxes: Noncorrosive, quick-wetting solder fluxes, designed primarily for use on copper and copper-base alloys, have just been developed by Federated Metals (New York). The fluxes utilize derivatives of hydrazine and are called H Series Fluxes. They reportedly can be used with all soldering techniques and are available in pint- to drum-size containers.

KING SIZE

This giant 37 ton Cat Poly Reactor is one of 4 units shipped to a large petroleum refinery in the State of Washington. It is 4'-3½" in diameter by 32'-0" long and has a 1 3/16" thick shell. Each of its 8" thick heads is attached to the shell channel with 28 special alloy stud bolts 2¾" diameter by 15¼" long having nuts 4¼" across the flats. Into the 5¾" thick tube sheets 190 tubes, 2½" O. D., No. 5 gauge and 30'-0" long, are rolled and seal welded. Designed for 1,230 lbs. pressure on the tube side, the reactor was completely X-rayed and stress relieved.

Vogt, a leading builder of shell and tube reactors for poly plants, has the competently skilled personnel and modern mechanical facilities with which to provide heat transfer equipment for the most exacting services in petroleum refineries, chemical plants, and related industries.

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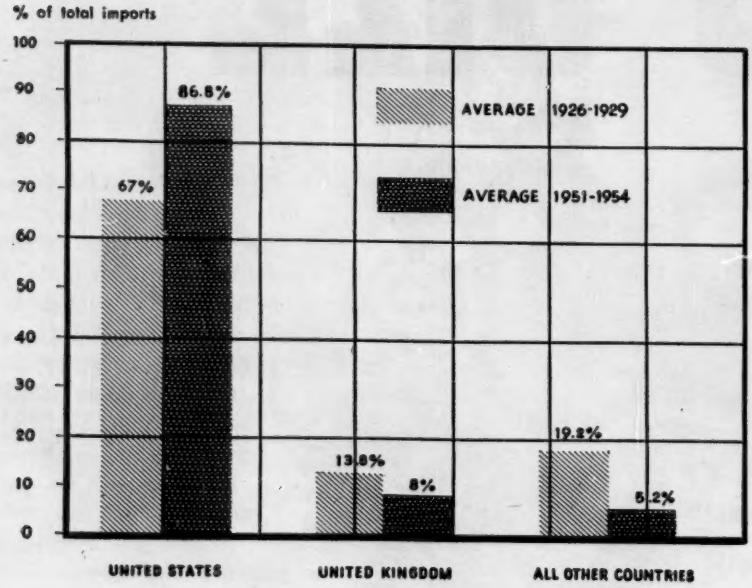

CMRA Looks at Canada

What is the status of Canada's chemical process industries? How fast and in what direction will expansion take place, and, concomitantly, how will imports and exports be affected? These and a host of other pertinent questions about the Dominion's chemical prospects were answered last week by Canadian chemical experts. The occasion: 1956 resort meeting of the Chemical Market Research Assn. at Quebec's famed Chateau Frontenac.

Opening the Thursday session with a discussion of Canadian research, Shawinigan Chemical's President R. S. Jane forthrightly pointed out that "research effort in Canada has not been commensurate with the industrial potential of the country," and that "on a per-capita basis, we in Canada are considerably behind the U.S. and the United Kingdom."

There are two basic reasons for this: (1) as a pioneer country, Canada first developed research in primary industries (agriculture and mining), and (2) most Canadian plants are essentially branch plants of foreign corporations, and research has normally been done by the parent organization in the U.S. or in Britain.

Research Costs More: Drawing attention to the great increase in research expenditures that took place between 1939-55, Jane noted that per-capita research costs in the U.S. increased 12-fold, from $2.20 to $26.10; in the United Kingdom, 30-fold, from 70¢ to $22; and in Canada, 20-fold, from 60¢ to $12.20 Even after adjusting dollar values to the 1935-39 constants, there has been a 10-15-fold increase of research expenditures over prewar years.

The amount of research (presumably all research, not just chemical) done in government labs in Canada is actually more than double that done in the U.S. or in the U.K., although the amounts financed by the governments are about the same in all three countries.

But the research situation in Canadian industrial labs is cause for concern, Jane said; in 1955, per-capita spending for research by industrial labs was $23 in the U.S., $19 in the United Kingdom, but only $5 in Canada.

Encouraging is the fact that during the past 4-5 years there has been a marked upsurge of interest in industrial research; British and U.S. firms, for example, are adding research facilities to their Canadian branch plants, and wholly Canadian firms are facing up to the need of research programs.

Basically, most of Canada's difficulties in industrial research are intimately associated with the absence of a well-developed secondary manufacturing industry. How then does the Canadian chemical industry justify money spent on research? Canadian new-product research, says Jane, "is pretty much a gamble on the future of Canada. When a Canadian chemical company embarks on an extensive research program, it means that its top management is willing to bet real money on the growth possibilities in this country [Canada] and is firmly convinced that in the next two decades Canada will become one of the most important industrial nations in the world."

The Next 20 Years: Canada's chemical industry will play a major part in this growth. J. A. Davis of Du Pont of Canada predicts the nation's chemical demand will jump from its 1955 level of $1.2 billion to $3.4 billion in 1975.

Looking at the major chemical segments (*see box p. 98*), Davis pointed out that Canada's agricultural chemical demand is now $75 million/year—about half for fertilizers, half for pesticides and food supplements. But it will climb to $200 million in the next 20 years. Chemicals needed to process forest products will increase from the present $50 million/year to $110 million/year within the next two decades. Mining, smelting and refining of minerals will likely take some $150 million worth of chemicals in 1975, compared with $35 million now. (Iron ore output doubled from '54 to '55; nickel will probably double within the next 20 years; uranium concentrates, worth $26 million in '54, will reach $300 million in '59; a fourfold boost of aluminum production is foreseen by 1975.)

Hard to forecast are automotive chemicals needs. The rubber industry

Using Salt Efficiently

by **INTERNATIONAL SALT COMPANY, INC.**—America's largest producer of salt

How to Find the Strength of Salt Brines—Accurately

In most of today's plants, the type of hydrometer called a Salometer can generally be used to measure the strength of salt brines most accurately. This device (similar in principle to the hydrometer which checks the condition of your car's battery) is convenient to use—and its scale permits fast calculations for a variety of plant needs. The Salometer scale reads from 0° in pure water to 100° in saturated brine, with each degree representing a percentage of fully saturated brine.

Using the Salometer with maximum accuracy, however, isn't just a matter of reading the scale. A number of simple precautions must also be taken to make sure the Salometer records correct brine strength. Here they are:

1. Check the temperature of the brine. Since most Salometers are calibrated for reading at 60° F., brine temperature should be kept at this level during testing. When other brine temperatures are encountered, it is necessary to use the following table of simple correction factors. These will help provide a completely accurate measurement of brine strength.

APPROXIMATE CORRECTION IN SALOMETER DEGREES

Observed Salometer reading	Subtract per degree below 60° F.	Add per degree above 60° F.
0 to 10	0.049	0.060
11 to 20	0.064	0.082
21 to 30	0.077	0.094
31 to 40	0.087	0.103
41 to 50	0.095	0.112
51 to 60	0.102	0.118
61 to 70	0.107	0.123
71 to 80	0.112	0.128
81 to 90	0.116	0.131
91 to 100	0.120	0.134

For measuring cold brines, such as those used in meat-packing plants, special 38° F. Salometers may be used. Special temperature-correction factors are available when using this type of Salometer to test brines above or below 38° F.

2. Brine should be tested only in a straight-walled cylinder made of clear glass—set on a level surface. Any moisture that collects on the outside of the cylinder should be wiped off before testing procedures start.

3. Salometer stem must be thoroughly dry, clean, and free from grease or caked salt crystals. Also, the Salometer should not touch the sides of the cylinder when readings are taken. It should be read with the stem in a vertical position.

4. Check new Salometers by placing them first in clear water; reading should be 0° S. Then empty the cylinder, rinse with a saturated salt solution, and refill with fully saturated brine; reading should be 100° S. Both water and brine should be at 60° F.

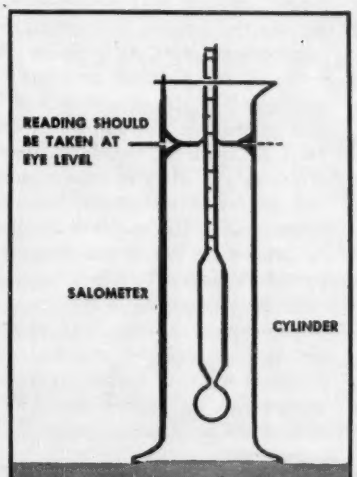

Illustration showing the proper eye level for reading a free-floating Salometer in a straight-walled glass cylinder.

5. Correct reading technique. Brine tends to rise along the sides of a glass cylinder, forming a concave surface known as a meniscus. For correct reading, the eye should be brought to a point level with the *bottom* of this meniscus. Errors of two or three degrees are possible if reading is taken at the point where the brine has risen along the sides of the cylinder.

Special Salometers. In the canning industry, where brine is used for quality grading, a different type of Salometer is often used. It's graduated on a scale where 100° S. represents brine containing 25% salt, instead of the normal 26.395%. Special hydrometers may also be used in the tanning or chemical industries. But the same procedures outlined here must always be followed when brine is to be tested—no matter what type of hydrometer a plant uses.

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Through skilled and experienced "Salt Specialists," International can help you get greater efficiency and economy from the salt or brine you use. International produces both Sterling Evaporated and Sterling Rock Salt in all types and sizes. And we also make automatic dissolvers in metal or plastic for both kinds of salt. So we can recommend the type and size of salt most perfectly suited to your needs.

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PRODUCT OF INTERNATIONAL SALT CO., INC.

CANADA'S BOOMING CHEMICAL DEMAND

	1955		1975	
	Million Dollars	Percentage of Total	Million Dollars*	Percentage of Total
Heavy industrials†	200	19.5	600	17.6
Fertilizers	40	3.9	100	2.9
Washing compounds	100	9.8	325	9.6
Paint	120	11.7	250	7.4
Primary plastics	80	7.8	410	12.1
Compressed gasses	20	2.0	70	2.0
Cold-tar products	15	1.5	70	2.0
Pharmaceuticals	110	10.7	350	10.3
Toilet preparations	40	3.9	125	3.7
Miscellaneous††	300	29.2	1,100	32.4
Export demands	200	19.5	600	17.6

* In terms of 1955 dollars.
† Sulfuric acid, caustic and chlorine represent 25% of total.
†† Includes explosives, synthetic rubber, most organics and dyes, plus new products.

consumes chemicals at a rate of $40 million/year, including 90 million lbs./year of synthetic rubber. Two-thirds of the demand is for tires and tubes. But though auto output may well double in the next 20 years, a doubling of tire consumption in the same period is not likely.

However, other elastomer uses are expanding rapidly. One example: foamed products totaled 6 million lbs. in '55, may hit 300 million by '75. Chemical needs (by '75) of other secondary industries will shape up about this way: for foods and beverages, a threefold increase to $300 million; electrical apparatus, $25 million; textiles, a doubling, to $200 million; drugs, soaps, etc., will triple; plastics needs will climb from the present $80 million to $400 million/year.

Also talking about Canada's chemical industry and how it will be affected by future patterns in the development of natural resources, John Davis, associate director of the economics branch of Canada's Dept. of Trade and Commerce, went a bit further, pointed out certain qualifications.

Said Davis: "A growing proportion of Canada's exports—heavily weighted as they will be with iron ore, crude oil, and such industrial minerals as asbestos, gypsum and potash—will be leaving this country in comparatively unprocessed forms. As in recent years, much of our titanium and one-third to one-half of all our nickel, lead and zinc production will also be exported prior to chemical treatment as concentrates. . . . Only in respect to natural gas, where the cleanup procedure necessitates a fair measure of chemical processing, can an era of unprecedented expansion be safely forecast."

He had something to say about the import-export situation, too, pointing out that imports of chemicals and chemical products, though rising, may continue to lag behind domestic requirements as Canada gradually becomes more self-sufficient.

On the other hand, he said, exports may become less important. Some reasons: raw materials are fairly evenly distributed throughout the world, and many, e.g., oil and natural gas, are readily transportable; the cost of long-distance transmission of electricity is declining: New sources of power, i.e., nuclear energy, may well encourage more national self-sufficiency on the part of nations that have been handicapped by the lack of cheap power.

U.S. Export Opportunities: Winding up the Thursday morning session, Leonard Hynes, vice-president of Canadian Industries Ltd., described the nature and sources of chemical supplies needed by the Canadian industry and highlighted future opportunities for selling U.S.-made chemicals in Canada.

Heavy inorganics will continue to be supplied largely from domestic sources. However, the Canadian chemical industry's rapid postwar diversification into synthetic organics is not likely to continue at its recent rate; hence a large, though slowly diminishing, proportion of the Dominion market, will be supplied by imported chemicals in this category.

Why doesn't Canada make more of its own organics? Largely because the country's population is small and sparsely settled; potential markets are often not large enough to justify the building of plants big enough to compete with imports.

The U.S. is in a favored position to supply these needs, especially because the large U.S. plants are often widely scattered across the country, thereby enjoying a freight advantage over a

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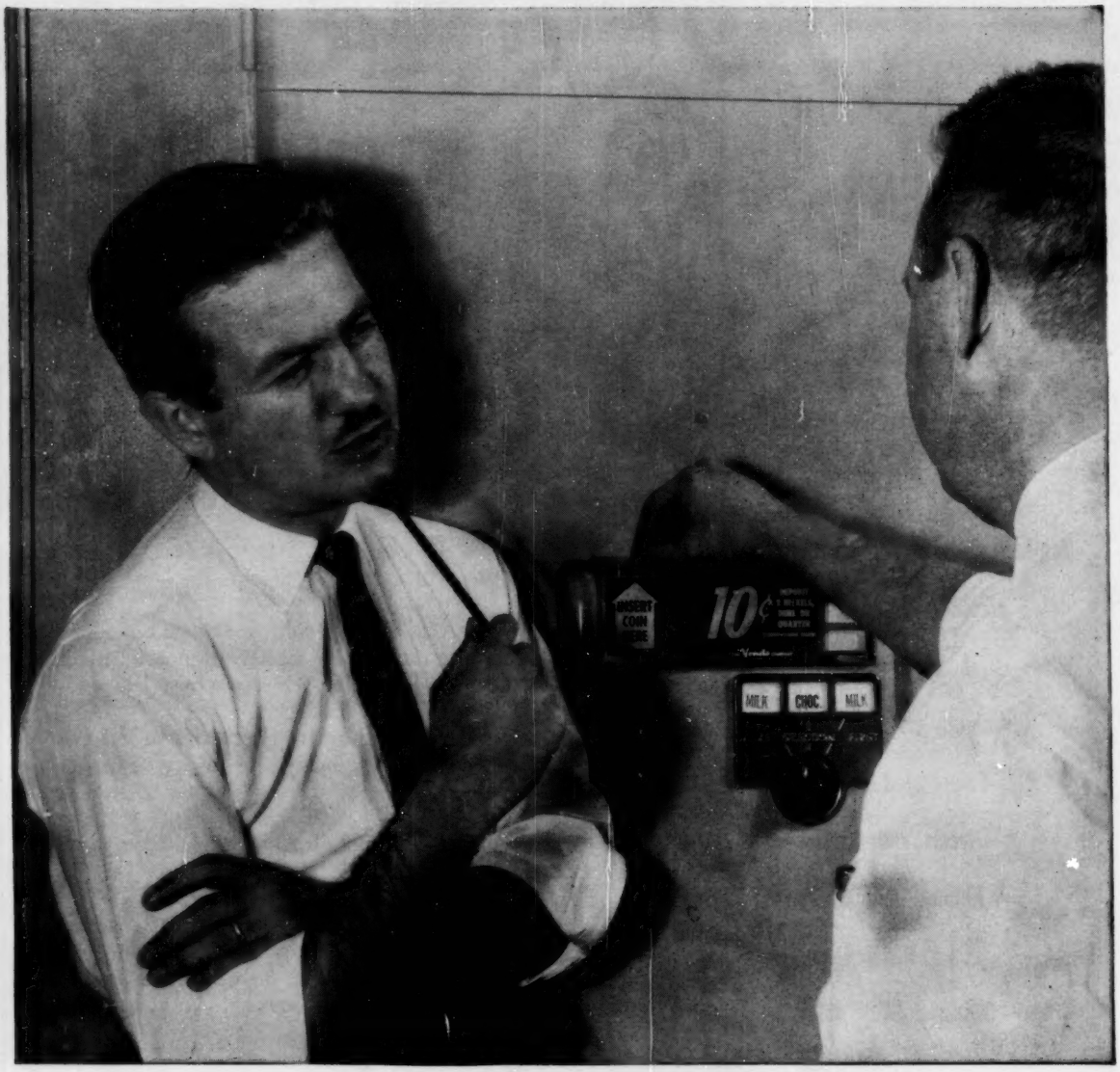

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"I couldn't agree with you more!"

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"They've more than demonstrated that fact."

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single, centrally located Canadian unit.

In fact, said Hynes, "of our Canadian total imports of chemicals and allied products during 1955—equal to $260 million, or 24%, of our consumption of chemicals—about 85% were supplied by the U.S."

CPI Output Tops $1 Billion: But don't think Canadian chemical process industries have been standing still; production in '55 exceeded $1 billion for the first time. Despite the obvious handicaps, the Canadian chemical industry has been growing because of (1) indirect export of chemicals used in processing Canada's natural resources (for example, Canada's largest chlorine outlet is in the manufacture of newsprint, 94% of which is exported.); (2) direct export of such products as fertilizers (over 75% of which went to foreign markets in '55); (3) available resources (cheap hydroelectric power, sulfur-rich smelter gases, salt, petroleum, natural gas); (4) in some cases, freight advantages over foreign competitors; (5) tariffs (most of the diversification into organics was aided by tariffs—the majority of 30 or so important chemicals whose domestic manufacture was begun during the last decade are subject to an import duty of 20% or more).

What is the outlook for the next 10 years? Output of those chemicals already made in Canada will increase, e.g., sulfuric acid, paints; the number of new chemicals produced in Canada will now grow rapidly; demands for chemicals with a small home market, e.g., dyestuffs, will be met entirely with imports; petrochemicals will show gradual growth (value of petrochemical production increased from $24 million in '47 to $127 million in '55); imports will continue to represent at least 20% of Canadian consumption during each of the next 10 years; and over the long term, Canadian manufacturers will find the most fertile ground for diversification in the medium-volume synthetic organics field, e.g., primary plastics, solvents, organic agricultural pesticides.

Pulp and Paper Session: Keynoting the theme of the Friday meeting, "Chemicals and the Pulp and Paper Industry," Chairman J. A. McCoubrey, of North American Cyanamid, noted that pulp and paper is Canada's leading manufacturing industry, accounts for about 23% of the nation's exports. Total output of Canadian wood pulp in '54 hit 9.6 million tons, accounted for 22.8% of world production. (By comparison, the U.S. produced 18.3 million tons, or 43.5% of the world total.)

Urging attending marketers to "put away your notebooks," the first speaker, Warren Beazley, of Industrial Cellulose Research, warned he had "no statistics to offer" and would make no forecasts. Thus sidestepping any attempt to pinpoint the size and specific nature of future chemical markets in the industry, Beazley limited his talk to sketching the functions of old and new chemicals in various phases of pulp processing.

Contributions of the last two speakers were of similarly general nature. Bruce Gralow, vice-president of Ontario Paper Co., outlined the nature of "Chemicals From the Pulp and Paper Industry;" Wilfred Gallay of E. B. Eddy Co., in a talk titled "Potentials for Chemicals in Paper Manufacture and Paper Conversion," stressed problems of testing new chemicals for possible use in pulp and paper processing, laid responsibility for preliminary testing at the doors of firms attempting to sell new chemicals to the pulp and paper industry.

Potassium Perks Up

Potassium salts racked up new market records in '55, the U.S. Bureau of Mines reports. Total U.S. output climbed 6%—to more than 3.5 million tons (more than 2.06 million tons K_2O equivalent). Producers sold 3.4 million tons for about $76.5 million—$5 million more than in '54 and $11 million more than in '53.

Prices were higher—averaged $22.51/ton in '55, up 55¢ from '54 and 46¢ from '53.

Both imports and exports soared, the former from a near $8.4 million up to some $11.8 million, the latter from about $5.5 million up to $9.2 million.

Taken together, these figures show an apparent domestic consumption of 3.5 million tons of salts (2.05 million as K_2O), up 123,000 tons from '54.

New Mexico supplied 91% of U.S. output; major foreign sources (in order of importance) were West Germany, East Germany, France, Spain. Major export markets were other Western Hemisphere countries (65%), Asia and New Zealand.

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Market Newsletter

CHEMICAL WEEK
October 6, 1956

Development of an Argentine petrochemical industry (*CW, Sept. 22, p. 84*) will be the job of private capital, local and foreign, the president of the Argentine oil entity Yacimientos Petroliferos Fiscales (YPF) recently made clear to a *CW* reporter.

Says General Alfredo Intzaurgarat, "YPF doesn't want to go into the petrochemical industry. On the contrary, it is our great desire to deliver raw materials to those firms that are interested in using them. Negotiations with foreign companies are now in progress."

At the same time, the YPF head revealed that "the entire financing of Argentina's oil self-sufficiency program is covered by offers received last May." It was the first statement by any member of the Argentine government that indicates it sees clear sailing ahead in financing its oil program.

•

Also on the foreign scene, the British National Coal Board's new $28-million coke plant at Wingerworth, England, will be opened on Oct. 30.

The unit is designed to produce 1,400 tons/day of coke, and the new carbonization and chemical plant will provide 27 million cu. ft./month of gas for domestic consumption. Also to be produced: ammonium sulfate, naphthalene, benzol, sulfuric acid, pitch and tar. The completely integrated installation—said to be one of Europe's largest—will carbonize 2,000 tons of coal daily.

•

Makers of germicidal chemicals for dairies, restaurants and food plants must observe new labeling requirements. The rules, issued by the U.S. Dept. of Agriculture under the Federal Insecticide, Fungicide and Rodenticide Act, cover labeling of germicidal chemicals used in hard-water areas.

The new rules (*Federal Register, Sept. 19*) require manufacturers or distributors that submit labeling with specific claims and directions for use of germicides in hard-water areas to give USDA adequate experimental data to justify their claims of effectiveness. The reason: naturally occurring hard waters can slow down the rate of germicidal activity.

Products that move interstate must be registered under the act, and their labels, list of ingredients, directions and cautions for use must be approved by USDA. Not affected by the new rules is germicide labeling without specific directions for use in hard-water areas.

•

Copper supplies are now sufficient to meet the requirements of an emergency mobilization, and the Office of Defense Mobilization is terminating its copper expansion activities. The goal of 2.27 million tons/

year, set in 1952, is being exceeded by the combined output of primary production, scrap, imports.

At the moment, there's apparently enough copper available to satisfy civilian users, too. And with no output interruptions threatening in the U. S. or elsewhere, sales aren't as brisk as producers would like. Sellers of both brass and copper products to the automotive industry have been particularly disappointed.

Some market followers are predicting that October copper movement will be better than last month's, though few expect any startling increase. The present 40¢/lb. quote will likely hold, at least until the level of fourth-quarter business is more clearly indicated.

•

Anhydrous ammonia and nitrogen solution prices are being automatically advanced in accordance with schedules announced earlier this year (*CW Market Newsletter, Sept. 1*). The former, which sold at $72/ton for July-September, moves up to $75 from now through December; nitrogen solutions go from $1.10/unit of nitrogen to $1.14.

National Aniline is slashing diisocyanate prices 50%. The company's Nacconate 300, formerly selling at $3.75/lb., now costs $1.75. When furnished as a 50% solution in *o*-dichlorobenzene, the material will sell for $1/lb. Incidentally, Allied's near-completed multimillion-dollar diisocyanates plant at Moundsville, W. Va., should begin producing next month.

•

ICC has received a formal petition filed by Eastern, Western and some Southern railroad lines to (1) increase freight rates by 15%, and (2) make a study into the whole rate revenue of all railroads. Earlier, there had been some question whether the Southern lines would go along with the 15% request or plump for higher rates (*for effect on chemical shippers, see p. 56*).

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending October 1, 1956

	Change	New Price
UP		
Benzyl salicylate, bots.	$ 0.10	$1.60
Stannic oxide, dms., dlvd., E.	0.015	1.08
Tankage, animal feeding, 9-11% ammonia,		
N. Y., bulk, unit ton	0.25	5.50
Chicago, bulk, unit ton	0.50	6.75
DOWN		
Potassium stannate, dms., frt., alld., E.	0.004	0.721
Sodium stannate, dms., wks., frt., alld., E.	0.005	0.593
Stannic chloride, anhyd., dms., works	0.005	0.809

All prices per pound unless quantity is stated.

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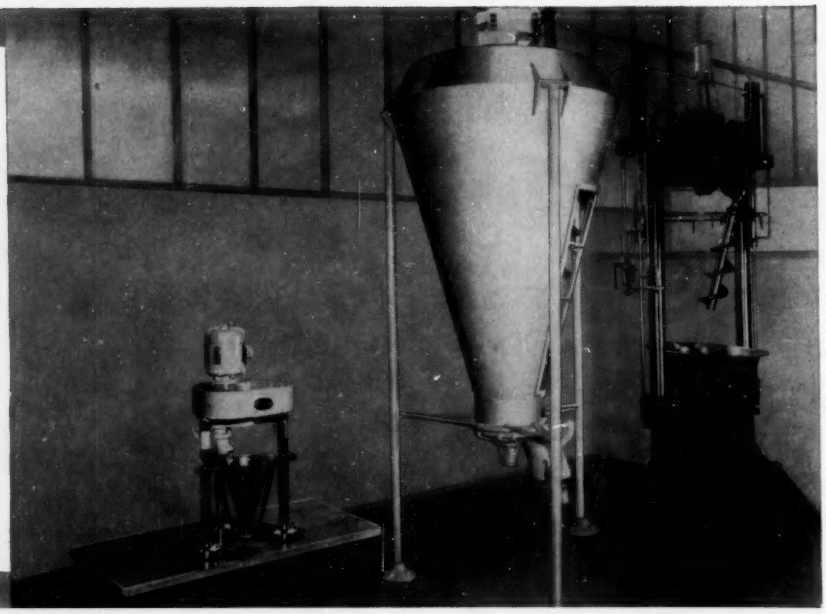

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Uniform, *quick* mixing of any number of dry materials in any proportions . . . wetting dry materials with small quantities of liquid . . . or dissolving solids in a liquid media . . . these are the exclusive features of the *new* Nauta Mixer. The gentle, yet positive action of the precessional motion of the Nauta intimately mixes products in any proportion . . . without dusting or change in their original characteristics.

By shortening time cycles required for thorough mixing, the Nauta Mixer increases production. The revolutionary precessional motion means less power consumption. This is a combination that results in substantially lower costs.

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A quantity of your product ingredients can be mixed under actual production conditions in a Nauta Mixer now in the Buflovak Research Laboratory and Testing Plant, with positive results. Let us tell you about this service.

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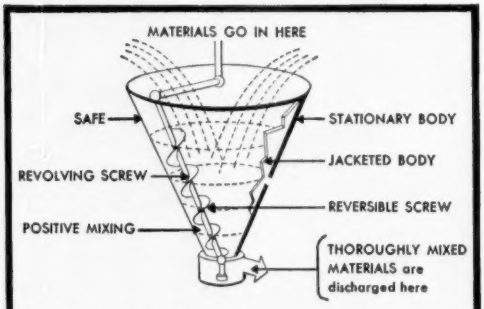

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The advantages of Nauta Mixers can be enjoyed wherever dry materials require thorough mixing.

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Fertilizers	Seeds
Fish meal	Sizing compounds
Flour	Starch
Food products	Sugar
Insecticides	Many other products
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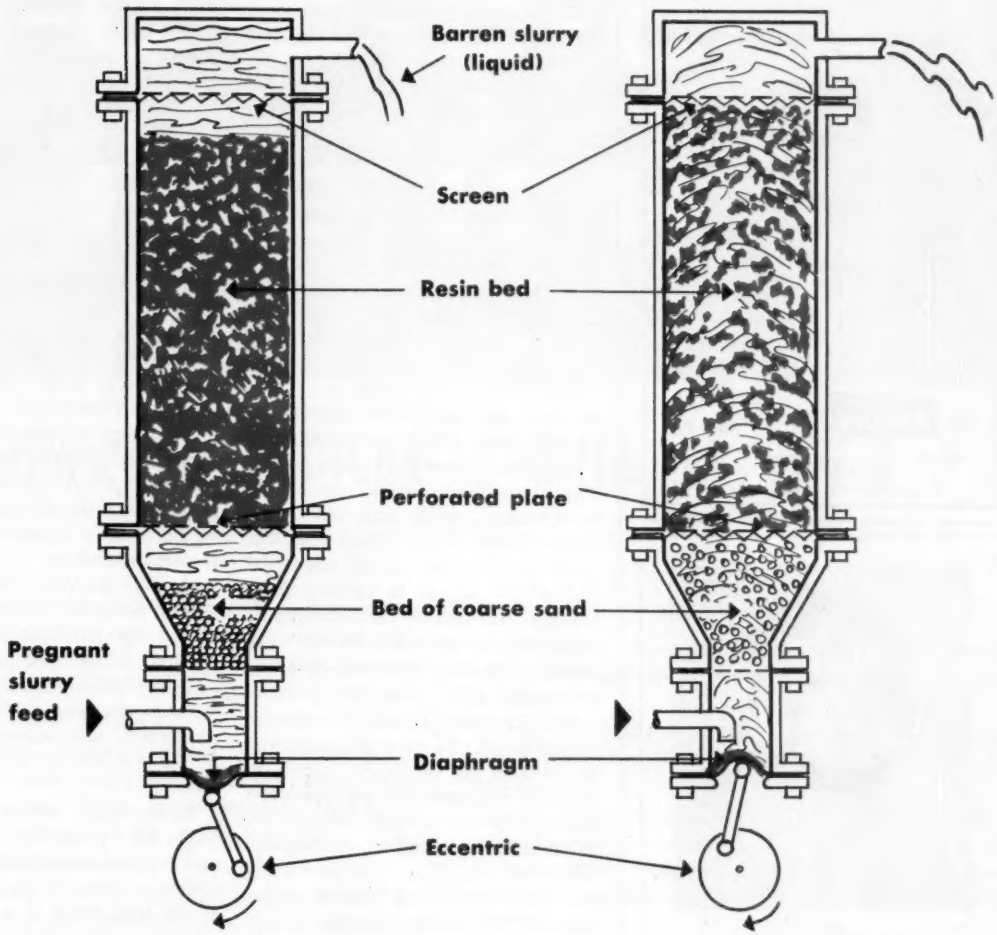
Ion-Exchange Pulse Column

Rapid pulsation, produced by the two steps described below, helps it take slurries in stride.



1. Diaphragm is depressed: resin compresses, slowing flow of slurry.

2. Diaphragm is elevated: expands, forcing slurry up through column.

Up-Beat Eases Slurry Through Exchanger's Packed Resin Bed

- New Australian ion-exchange column handles hydrometallurgical slurries of up to 40% solids.
- Experts concede it a chance of commercial success—provided that problems of resin attrition, equipment scale-up can be licked.

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Up-Beat Ion-Exchange Column (continued)

As a rule, fixed-bed ion-exchange columns are too easily clogged by solids to permit treatment of unfiltered pulps or slurries. But by adding a pulsating diaphragm at the bottom of the column, E. A. Swinton and D. E. Weiss of Commonwealth Scientific and Industrial Research Organization (Melbourne, Australia) are busily proving an exception to this rule. Result: modified equipment passes slurries of up to 40% solids as readily as conventional units handle filtered liquor.

Pulsed ion exchange is already catching the eye of uranium and other hydrometallurgical processors. Because of its simplicity and efficiency, ion exchange has been widely adopted for the extraction of metal values from chemically digested ores. By eliminating the need for prefiltering metal-rich slurries, the pulsing system is bidding to bolster ion exchange's preferred position in this rapidly growing field.

Operating results with a pulsed column, the Australians report, are equal to runs using clear solutions in conventional fixed-bed columns. Although the equipment is too new to have received much attention in the U.S., Illinois Water Treatment Co. (Rockford, Ill.) has carried out initial studies that appear to confirm these findings. But despite the encouraging tests, IWT is reserving judgment until pulsed units have been scaled up to commercial size.

Old Principle: Though it's new to ion exchange, the principle employed by Swinton and Weiss isn't novel to chemical engineers. Pulsed operation has received considerable attention for liquid-liquid extraction applications (*CW, Dec. 15, '51, p. 32*), and it has been tried before—but without success—in continuous ion exchange.

National Lead, for one, attempted to use periodic pulsations to agitate a fixed-bed column. The column was pulsed once or twice every few minutes to overcome the clogging effect of slurry downflow through the bed. But the unblocking action provided by occasional pulsing was not sufficient to maintain efficient operation.

By changing both the rate of pulsing and the direction of the feed, the Australians appear to have hit on the solution of snags in slurry-handling. Rapid pulsations (110 strokes/minute) are developed by a reciprocating diaphragm actuated by an eccentric at the bottom of the column, keep the resin bed in a state of teeter. With each pulse, the compact resin "opens" sufficiently to permit the pregnant slurry feed to move upward a short distance, but for too brief a period at any one time for turbulence to develop. Over-all effect: pockets and channeling in the bed are eliminated; flow stoppage is effectively prevented.

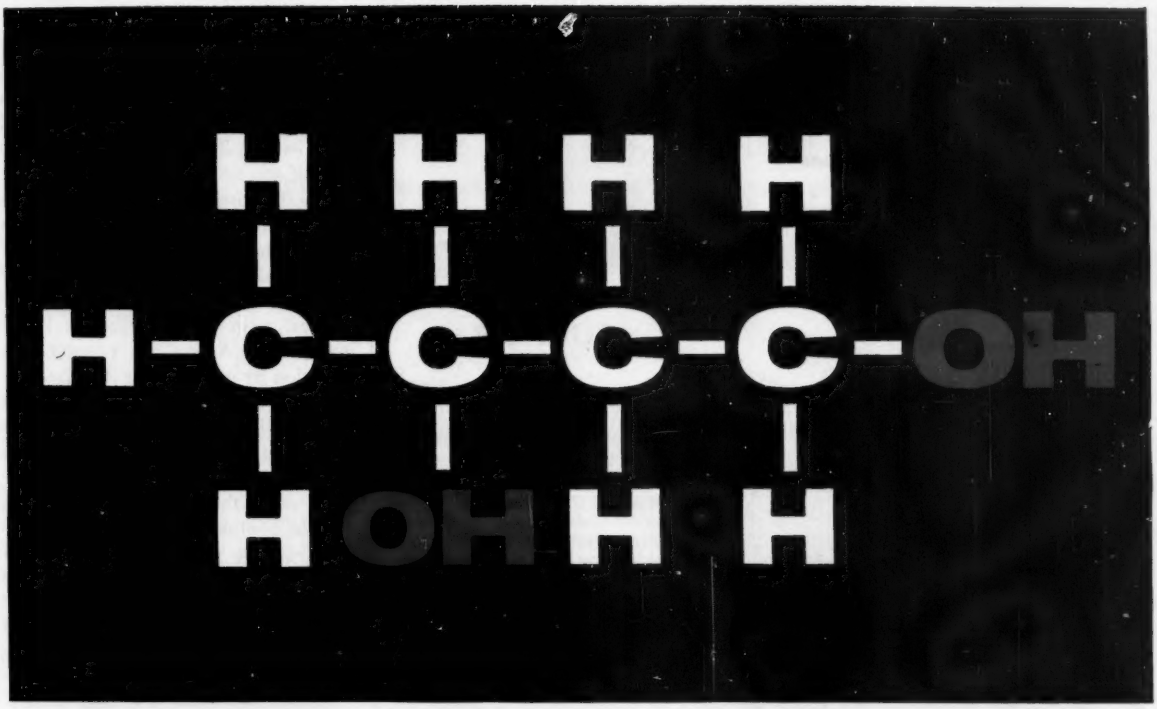
Besides the addition of a diaphragm, a few other changes are required to modify conventional columns for pulsed operation. For one thing, coarse sand packing is required directly below the resin bed to smooth out and distribute the pulses. Feed pulsation may be prevented by a valve in the feed line or—if a positive-displacement feed pump is used—by an air vent or chamber at the top of the column. Air bubbles in the column present a hazard that, if not prevented, causes the pulses to be absorbed, pressure drop to increase.

The use of upflow through the column also requires the addition of an upper screen to prevent carry-over of resin in the barren slurry. Though the actual bed movement in its state of teeter is relatively slight*, buoyancy of the resin in high-density slurry increases its tendency to carry over. Actually, the buoyant effect induced by pulsing becomes an added advantage during operation since it permits a gradual classification of the resin—i.e., the heavier, loaded beads work towards the bottom of the column, less heavily adsorbed resin remains on top in the last zone of resin-slurry contact.

Backwashing, too, is reversed and improved by pulsing, claim Swinton and Weiss. Results to date indicate that upflow washing (in the same direction as the feed flow) at a high flow-rate removes dirt and slime effectively with less water and shorter time cycle than is required for conventional backwashing.

Caution on Attrition: Though ion-exchange experts in this country agree that the pulsed column shows commercial promise, they're still wary of its effect on resin attrition. Most of them side with the preliminary findings that resin movement is small enough to avoid excessive attrition and fracture within the bed. But a

*Movement is approximately 5-10 times the distance of the volumetric displacement of the flow rate. In small column used by Swinton and Weiss, the bed moved plus or minus ⅛ in. at a flow rate of 1 gal./minute/sq.ft.



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1, 3 Butylene Glycol is a low-cost, 4 carbon glycol with unusual stability. Its combination of two non-adjacent hydroxyl groups prevents dehydration or ring closure. It is highly hygroscopic, non-toxic and soluble in water and most organic solvents.

1, 3 Butylene Glycol's longer chain length and steric configuration open new possibilities for producers of textile lubricants; alkyds, polyurethanes, and polyester resins; printing inks; dyes; cosmetics; toilet goods and elastomers.

It is of particular interest in the preparation of phthalic, maleic and fumaric alkyd resins and polyesters for plasticizers, coating materials, laminates, and potting compounds.

1, 3 Butylene Glycol is available from Celanese in tank cars, compartmented cars and drums. Find out how this unusual glycol can improve your product . . . save you money in production costs. Write us for futher information. Celanese Corporation of America, Chemical Division, Dept. **552-J,** 180 Madison Avenue, New York 16, New York. Export Sales: Amcel Company, Inc. and Pan Amcel Company, Inc., 180 Madison Avenue, New York 16, New York.

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- **POLYESTERS.** Polyesters prepared with 1, 3 Butylene Glycol are non-crystalline in structure due to the glycol's steric configuration.
- **POLYURETHANES.** Saturated polyesters can be prepared from 1, 3 Butylene Glycol with various polyfunctional acids and alcohols.
- **SURFACE ACTIVE AGENTS.** Esterfied with fatty acids or etherfied with alkylated phenol, 1, 3 Butylene Glycol produces non-ionic detergents with good emulsion breaking properties and improved compatibility with non-polar compounds.
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PRODUCTION

minority view the new column with a wary eye, predict that resin-to-resin —or even resin-to-slurry—contact will take its toll in accelerated deterioration of the bed.

Another problem cited by the skeptics: retaining screens with openings large enough to pass suspended particles in slurry require use of coarser resin beads. And as bead size increases, resin loading capacity is reduced. The Australians counter this objection by pointing out that the confined bed utilizes more of the available volume within the column, needs less free space than conventional columns require for backwashing.

However, the resin-retaining screens present another problem in the physical scale-up of pulsed columns. As one equipment manufacturer points out, the use of upflow in a large column exerts considerable upward thrust, complicates screen construction.

Competition Ahead: Unless pulsed-column development proves to have greater-than-anticipated advantages, it's doubtful that many hydrometallurgical processors will hasten to modify existing plants. Reason: most such plants are relatively new, still have to write off a considerable capital investment in feed clarification equipment. As the proponents of conventional ion exchange are quick to point out, development of new flocculating agents for problem ores could make clarification as economic as the simple desanding of pulse-treated slurries.

But pulsed ion exchange faces even stiffer competition from other budding processes. Solvent extraction processes are making a strong bid for production berths—particularly in uranium ore processing, may soon be a worthy rival of ion exchange. And the resin-in-pulp (RIP) process, developed by MIT's A. M. Gaudin, Cyanamid, and National Lead, has already won a spot in five commercial (in operation or abuilding) plants. RIP method uses resin confined in a screen basket immersed in pulps (8-10% solids), but is probably less efficient than a column operation.

Once it has proved itself in a commercial installation, the pulsed column may take over a leading role in hydrometallurgical ion exchange. And if the projected growth of uranium processing is any indication, there will be plenty of opportunities for it to try.

CHEMICALS OUTLOOK

October, 1956

This news bulletin about Wyandotte Chemicals services, products, and their applications, is published to help keep you posted. Perhaps you will want to route these and subsequent facts to interested members of your organization. Additional information and trial quantities of Wyandotte products are available upon request . . . may we serve you?

PLURONICS IMPROVE LATEX PAINTS

The Pluronic* series of nonionic surface-active agents is being used successfully by manufacturers of latex paint to control viscosity of latex systems, and as dispersing agents for prime and extender pigments . . . the very low foaming characteristics of the Pluronics also make them attractive.

Both Pluronic L62 (liquid) and, more commonly, Pluronic F68 (flake) have enjoyed success as dispersants to improve the characteristic shades of pigments used in latex formulations. Recently, tests conducted in our laboratories have shown that the intermediate numbers of the Pluronic series, such as Pluronic L64 (liquid), give an excellent balance of wetting and dispersing properties.

The concentration of Pluronic necessary to provide good dispersion is dependent on the vehicle, pigment, extenders, and other additives. But in most instances it is about 1%, based on the total pigments other than clay. With clay extenders, the concentration of Pluronic should be increased to about 2%.

Pluronic L62 is particularly effective in improving the brushability of highly bodied latex paints and alkyd-modified latex paints, when used at a concentration of about 5 pounds per 100 gallons of finished paint. Pluronic L62 has even been effective in salvaging paints which have set up because of too high pigment loading, the bodying effect of casein, or excessive thickener.

PLURONICS INCREASE DENSITY OF RESINOID GRINDING WHEELS

Pluronic grades L44, L62, L64 are finding increasing use in both snagging- and cutting-type resin-bonded grinding wheels. An important reason: In the manufacturing process, the Pluronics, uniquely, perform three functions -- wetting, plasticizing, adhesion.

Adhesive properties of the wet resin are improved, allowing all of the dry resin to be picked up. Because the Pluronics, through their wetting action, more uniformly coat the abrasive grains used in the wheels -- and permit the mixture to flow more freely -- it is possible to produce a wheel with a more dense structure . . . even using cold-molding techniques. In addition, the incorporation of Pluronics into the wheel plasticizes it; improves the quality factor in snagging wheels; reduces brittleness, thus allowing better grit-to-metal contact.

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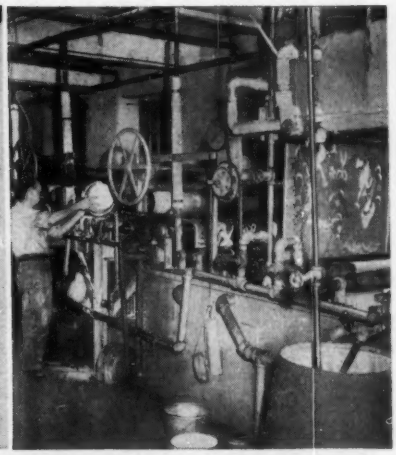
Persulfates, perhaps the least known of peroxygen chemicals, have unique properties which make them useful in processes involving polymerization and depolymerization, organic synthesis and others. This class of peroxygen compounds has applications in such diverse fields as textiles, soap, rubber, adhesives and others in which unique properties expedite processing.

It is possible you have problems in which persulfates may be helpful. We suggest that you write for Becco Bulletins No. 34 and 68, which are bibliographies on the uses of persulfates. They contain 184 references in nineteen specific and a number of miscellaneous fields, including cellulose chemistry, fur bleaching and carroting, photographic chemistry, starch processing, metal surface treatment, etc.

Also, your technically trained Becco representative can discuss your problems from a specific and practical standpoint. Becco Ammonium and Potassium Persulfates are two among many peroxygen chemicals of which Becco is a leading producer.

Home Runs in the making. After a lengthy drying out process, bats are roughed to size, then turned on lathes before sanding and trimming. They are then bleached with hydrogen peroxide for uniform surface appearance before staining and finishing.

Germfree monkey in a germfree cage gets a germfree lunch from a germfree hand at Lobund Institute, University of Notre Dame. Sterile conditions from birth permit the study of the effects of *single* germ types. Becco Peracetic Acid has been found useful in some phases of this germfree research.



Printed fabrics pass through a solution containing sodium perborate. The original color is restored and the colors oxidized or fixed. Soaping, rinsing, washing and drying follow in this machine. A similar machine is used for washing after bleaching.

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MULTITUDES AMONG A MAZE of booths typified goings-on at New York's Coliseum where . . .

Instrument Makers Show Their Stuff

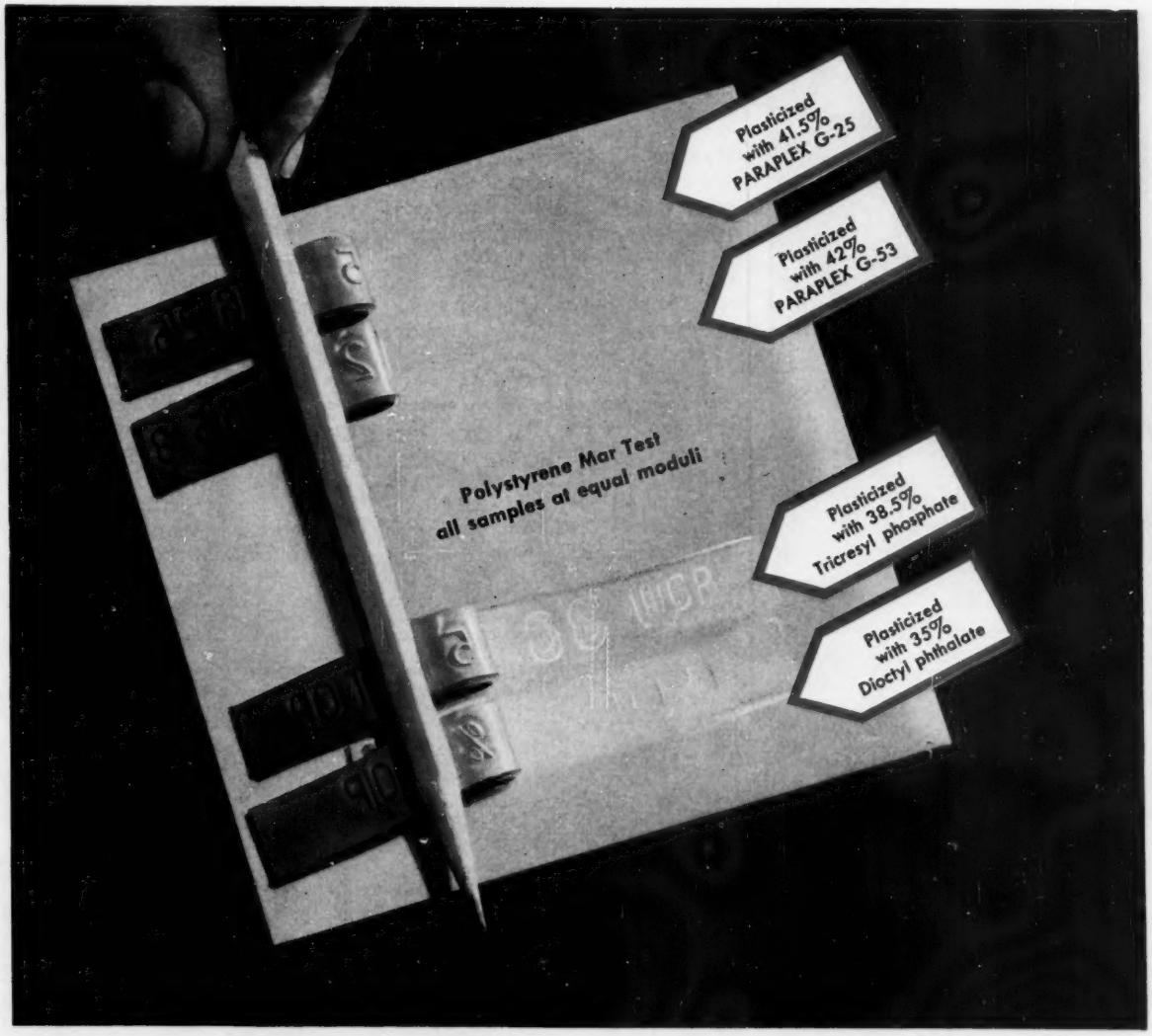
PROCESS instruments—by the truckload—on display.

CLINIC answers problems on basic principles.

When the instrument manufacturers displayed their wares at the ISA show last fortnight, they had—as all good showmen do—something for everyone. For the mechanically minded visitor, there were automatically programmed machines that perform intricate operations without human supervision. For electronic and instrument engineers, there were myriad "black boxes," gadgets and components for automated systems. But the brightest stars of the show—at least to many of the visitors from the chemical process industries—were the process-stream analyzers and controls, process data-handling systems.

One of the newest units on display was Beckman Instruments' electronic data-processing system that analyzes hundreds of temperatures, pressures and flows every second, computes production volume, material balances and other vital operating information. Typifying the instrument makers' trend to the use of built-in servicing features, the Beckman unit is liberally equipped with neon-lamp trouble indicators, features multifunction transistorized subcircuits to facilitate replacement and stocking of spare components.

Quiet Sessions: Away from the bustling activity that surrounded the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Plasticized with 42% PARAPLEX G-53
Polystyrene Mar Test all samples at equal moduli
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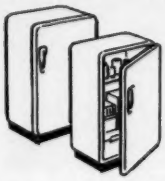
Cut down plasticizer migration with PARAPLEX G-53



The test illustrated here clearly shows why polymeric plasticizers such as PARAPLEX G-25 and PARAPLEX G-53 are recommended for use in vinyl compounds which contact polystyrene, lacquers, rubber, and baked finishes.

Take polystyrene for example. Widely used in refrigerators and other appliances, polystyrene is often severely marred by vinyl gaskets containing so-called fugitive plasticizers. When PARAPLEX G-25 or PARAPLEX G-53 is used, migration is drastically reduced and the appearance and physical properties of the polystyrene are virtually unaltered.

PARAPLEX plasticizers provide many other benefits, too. PARAPLEX G-53 is highly resistant to extraction by soaps, detergents, and hydrocarbons. It is extremely non-volatile. And its cost is quite moderate. High molecular-weight PARAPLEX G-25 has all of the physical properties of PARAPLEX G-53—and more.

For more information on *all* of the plasticizers produced by Rohm & Haas Company, ask for *What You Should Know About* PARAPLEX *and* MONOPLEX *Plasticizers.*

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Chemicals for Industry

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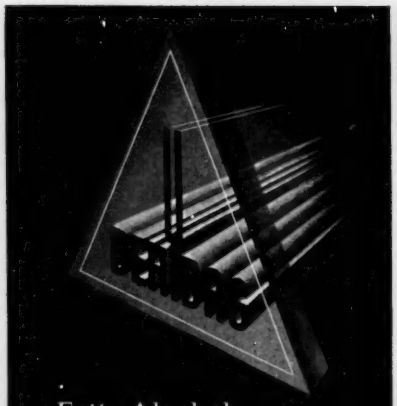
exhibits, the formal presentations of papers on data processing attracted some of the largest crowds attending the technical sessions. Discussions ran the gamut of data-handling topics—from such general considerations as semantics and terminology right down to such specific details as special-function circuits.

Consensus: data systems are fast becoming a vital tool for integrating complex processing operations.

Another important link in the process-control chain—process-stream analysis—held the spotlight at clinic sessions at New York's Statler. Cooperating on five concurrent clinics, Beckman Instruments, Industrial Instruments, Leeds & Northrup, Mine Safety Appliances, North American Philips and Perkin-Elmer played down sales angles, described basic principles and applications of the latest types of process-stream analyzers. Greatest interest, as evidenced by attendance, was in gas chromatography and infrared analysis.

Jobs Go Begging: The only ones who couldn't find all they were looking for at the show were technical personnel recruiters. By one recruiter's estimate, job offers outnumbered job seekers by at least 7 to 1. Underscoring the scramble for manpower was the remark overheard at a prominent exhibit: "If any of our competitors' engineers come around, show them anything they want to see, answer all their questions—and offer them a job."



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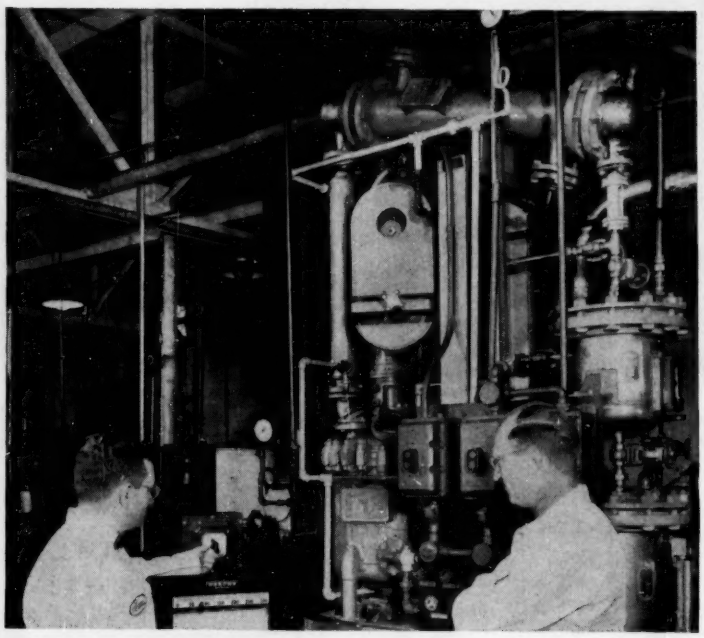

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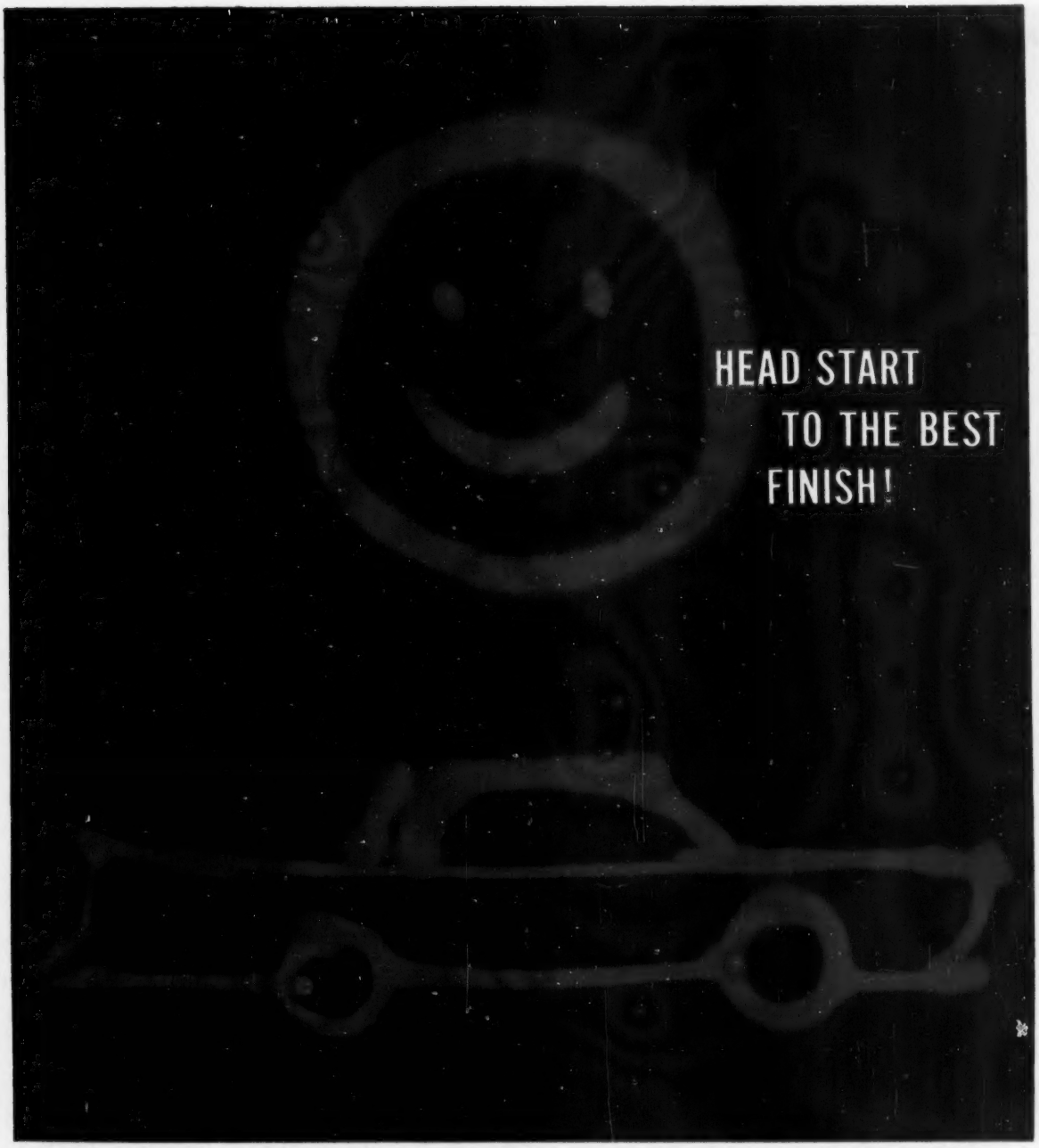
KEYSTONE of Lakeside Laboratories, Inc.'s (Milwaukee) expanding synthetic chemistry division is a single, compact unit (*above*) that can perform virtually all pharmaceutical pilot operations. Built to Lakeside's specification by Pfaudler, the unit is made of 316 stainless steel, adapts quickly to many chemical and physical functions, including high-vacuum distillations at pressures as low as 50 microns. Suitable for full-scale production as well as for pilot operation, it has been used for initial synthesis work in the production of Lakeside's antispasmodic drugs.



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Infrared-Analyzer Accessories: Explosionproof, corrosion-resistant accessories are now available from Beckman Instruments, Inc. (Fullerton, Calif.), for the Beckman L/B Infrared Analyzer Model 21. For air purging, cases are offered for the automatic standardization panel and control panel-amplifier. The manually operated standardization panel can be fitted with sealed mercury-capsule switches. Also, the control panel-amplifier can be mounted in a Crouse-Hinds explosionproof housing for greater safety.

•

Pipe Insulation: A new, wide-temperature-range molded insulation, called Kaytherm, has been designed by Keasbey & Mattison Co. (Ambler, Pa.) for use on steam and process piping at temperatures to 1350 F. The material is claimed to be strong, flame-resistant, chemically inert, insoluble in water. It's available in 1- to 4-in. thicknesses, in 36-in.-long half-cylindrical sections for pipes up to 33-in. diameter.

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Air Grinder: The Pulvocron, a new impact pulverizer offered by The Strong-Scott Mfg. Co. (Minneapolis), operates on the principle of air attrition. Automatic feeder, pulverizer and classifier are combined into one unit. Differential centrifugal pressures control radial inward air classification to give a finished product particle-size ranging from 99% less than 5 microns to 50 mesh.

•

Tube Connector: Mechanical Products Corp. (Chicago) is out with a new push-on, pull-off tube connector and plug. Said to be self-sealing, the connector is pushed over the end of the tubing and locked in place. If the connector is used as a tube plug, a pipe plug is inserted in the end for a seal. Connector is available for ¼-, 5/16- and ⅜-in. O.D. tubing, will operate to 1,000-psi. pressure and 25-micron vacuum.

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Gas Computer: For rapidly calculating the water content of gases, the National Bureau of Standards has developed a new circular slide-rule-type computer. It's expected to find use in determining refrigerating-system characteristics and data for control of moisture in inert and reducing gases.

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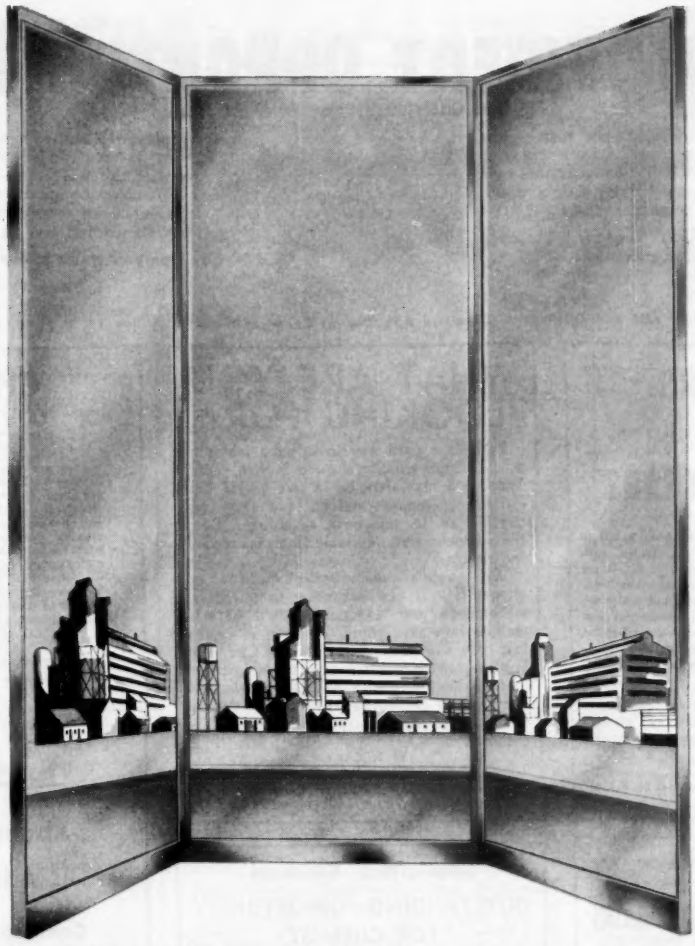

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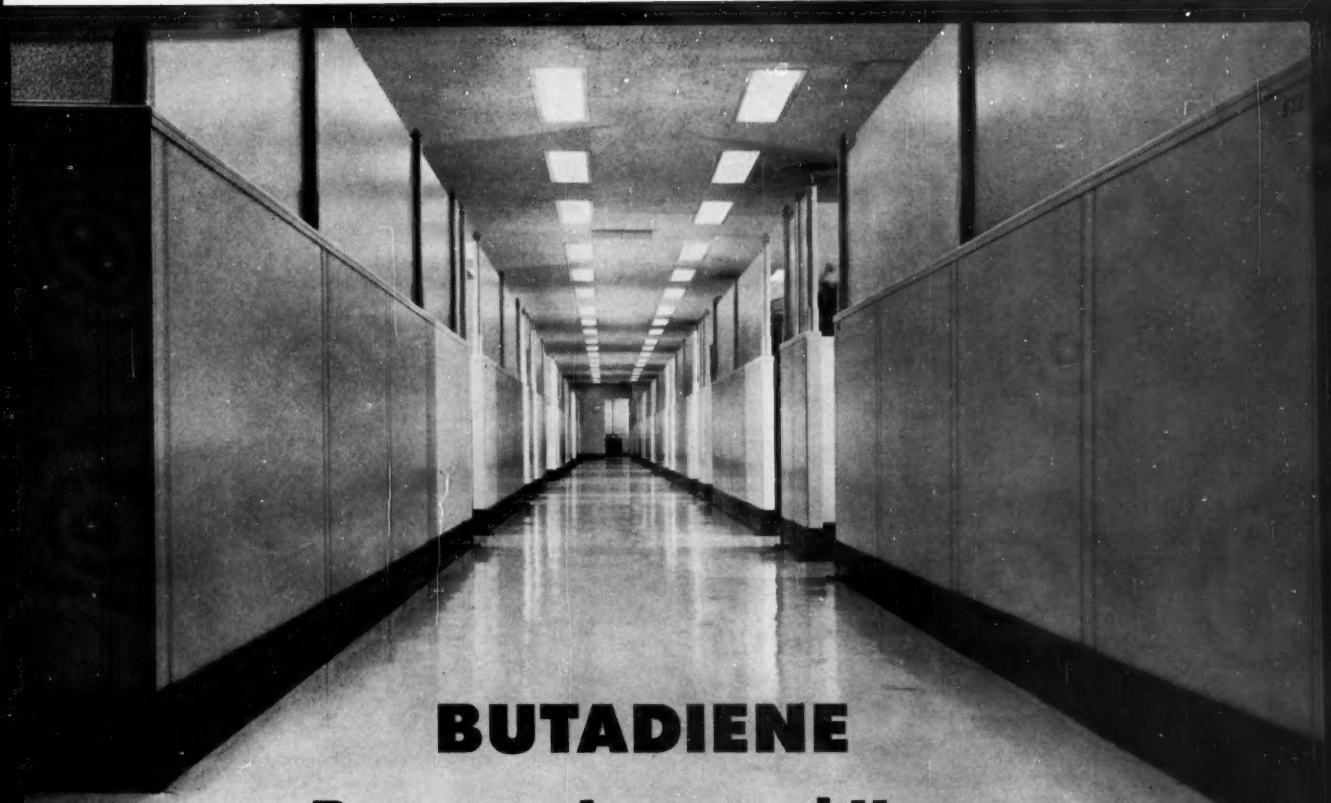

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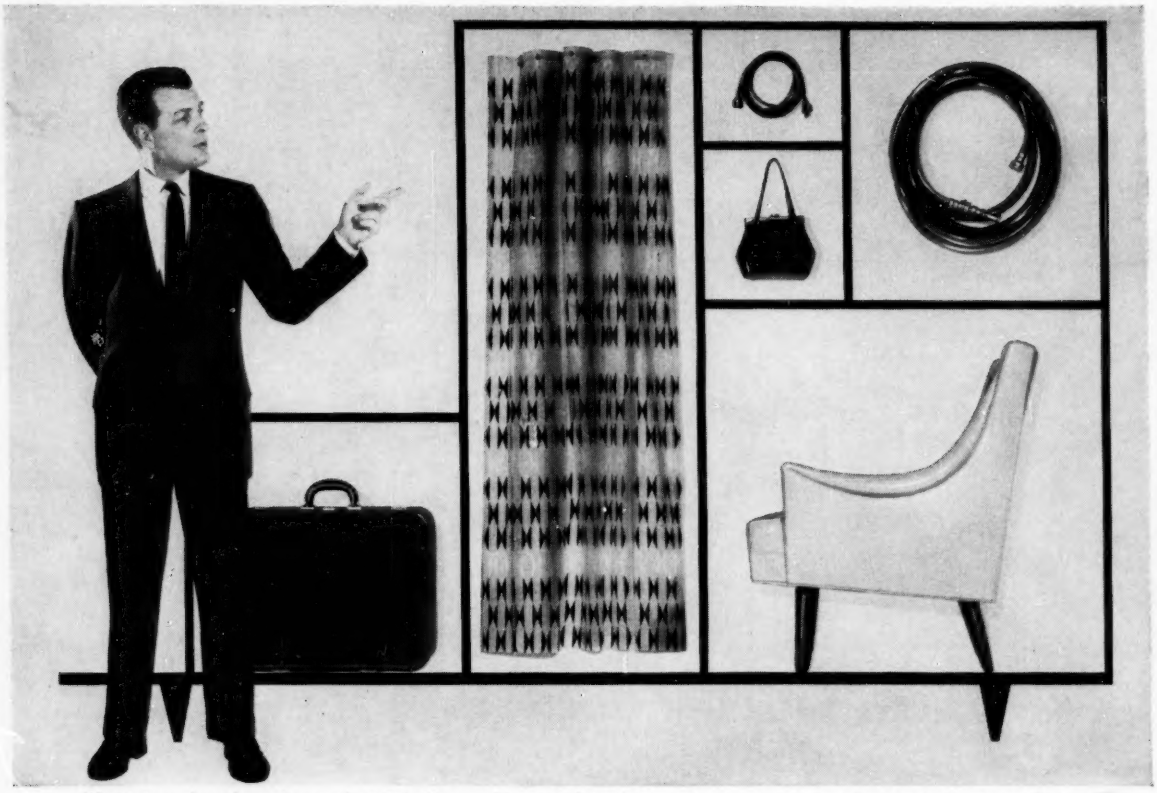

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